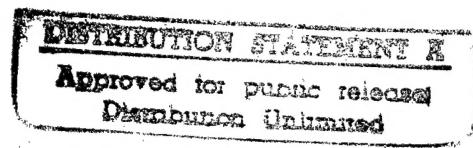


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21 February 1984



# USSR Report

ECONOMIC AFFAIRS

## EKO: ECONOMICS AND ORGANIZATION OF INDUSTRIAL PRODUCTION

No. 11, November 1983

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21 February 1984

USSR REPORT  
ECONOMIC AFFAIRS

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No. 11, November 1983

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## ASSOCIATION DIRECTOR CALLS FOR MORE OPERATIONAL FREEDOM

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 3-17

[Article by G. S. Antonenko, general director of the Odeskholodmash production association: "Independence and Responsibility are Inseparable"]

[Text] The Odeskholodmash association holds a leading position in the refrigeration equipment subbranch of Ministry of Chemical and Petroleum Machine Building as well as among enterprises of Odessa. During the years of the 9th and 10th Five-Year Plans the volume of output in the association doubled (as compared to 1970), although the number of workers remained the same. Assignments of the 11th Five-Year Plan are also being fulfilled successfully.

Odeskholodmash designs and manufactures low-temperature sets of equipment, mine air conditioners, and refrigeration machines for ships and agriculture, medical institutions and so forth. For more than a quarter of a century the plant has been delivering products abroad. Today its brand is known on all continents. A set of equipment for cooling milk was awarded a gold medal at an international exhibition of agricultural machines. A number of new machines have been created at the level of inventions, and have been patented in such industrially developed countries as the United States, England, Japan, the FRG and Italy.

Many factors have contributed to the high results achieved in the association, including re-equipment, improvement of technology, and mechanization and automation of production. A great deal of importance is attached to cultivating responsibility and initiative here. The general director, G. S. Antonenko, shares his thoughts about this. He has been in charge of the association since it was created -- in 1972. Metal worker, designer, deputy head engineer, director of a planning-technological and scientific research institute and general director of the association -- such are the landmarks in his business career.

The November (1982) Plenum of the CPSU Central Committee quite decisively raised the question of increasing independence and responsibility for the results of work, having included these factors among the most important ones in improving the control of production at all levels.

In June of this year the CPSU Central Committee and the USSR Council of Ministers adopted the decree, "On Additional Measures for Expanding the Rights of Industrial Production Associations (Enterprises) in Planning and Economic Activity and for Increasing Their Responsibility for the Results of Their Work." In order to test new measures and substantiate them, five branches will conduct an economic experiment beginning on 1 January 1984. Our branch was not included among them. But problems of expanding rights and increasing responsibility concern our production collective as much as others. I wish to share my ideas and discuss the practical steps which are being taken in the association in order to increase the responsibility and develop the initiative of the collective.

Responsibility is inseparable from independence. To begin, let us trace that inseparable interconnection using the example of the primary production unit -- the brigade.

#### How Initiative Is Awakened

It would seem that the brigades have the same people and the same equipment, but the return is incomparably higher than with individual work. What motivates the workers, what makes them master related occupations, cover for those who are absent, and help those who are behind, that is, display responsibility and initiative in their approach to their work? Are earnings really their only concern? The more I observe, the more I am convinced that the desire to achieve the goal set for the collective mobilizes the creative potential of each worker and causes him to search and think.

When workers are more independent in their selection of ways and methods of carrying out a task, even the act itself of making one decision or another contains hints of its future execution. It has been justified, variants have been considered, and resources and possibilities have been analyzed. That is, an imaginative approach is included in the very procedure of decision making: responsibility and independence have awakened initiative.

It seems to me that in our concern for raising the level of production specialization we sometimes forget about the fact that without good cooperation specialization is ineffective. The technological line or the machine tool itself can be highly productive in a given operation, but this does not mean that there will be more items. The splitting up of technological operations distances the worker from the final result. Collective forms of labor organization have become an alternative to this tendency.

The situation is apparently clear with brigades in the basic production. Their responsibility for the output of one product or another has been determined. They have the necessary labor and material resources as well as equipment at their disposal. But the fact is that the brigade is not an isolated unit. It is a part of a complex production organism, and is connected to it by indissoluble bonds. Dispatching, technical and transportation service, material supply and many other factors influence the results of its work. But are the dispatchers, batching workers, adjusters and loaders interested in whether one brigade or another achieves good results?

Unfortunately, no. For they are bound neither by responsibility for the result, nor by earnings.

I sometimes use city transportation and read the announcement: boys and girls are invited to take courses to be streetcar and trolley drivers; after completion the guaranteed earnings are 150-180 rubles. The wages of dispatcher personnel at the plants are in the range of 90-190 rubles. Who will go to work for such a salary? We shall not close our eyes to the fact that dispatchers are not among the most talented people. Their educational qualifications are not very high either. The people perform their work passively. We call this inefficiency and poor discipline, but it could quite possibly be regarded as irresponsibility. But this irresponsibility is predetermined by the situation. A cleaning lady who works at two jobs for 3-4 hours (nobody requires more than this, and they are glad about it!) receives more earnings than the plant dispatcher does. But under the conditions of the increasingly complicated modern production, the dispatcher staff plays an enormous role.

The contradiction between the significance of a position and its material rating can strongly influence the course of production. How is this? We think about this a lot. One of the variants of the decision was this: to include dispatchers in consolidated comprehensive brigades. We began this restructuring in our assembly shops where it is possible to see the final result. Now such brigades have appeared in the boiler and metallurgical shop as well. The final product for them is the unit (set of machines).

What did this produce? About 15 percent of the people who were separated from the final result have now actually become participants in the basic production (in addition to dispatchers, we have included loading-transportation workers and batching workers in brigades). The return has increased sharply. When a dispatcher or batching worker sees that the supplies are insufficient for the next day's shift or certain parts have not been delivered, they do not worry about the time, and stay after work in order to find out the reasons and provide for normal work the next day.

Growth Rates of Production  
Volume in Odeskholodmash  
Association, % of 1970

1970	100
1975	160.7
1980	210.3
1985	283.9
(plan)	

Growth Rates of Labor Productivity, % of 1970

1970	100
1975	163.1
1980	228.3
1985	299.5
(plan)	

If the production situation is favorable, everyone performs his functions. When a difficult time comes, everyone works on assembly: the master-brigade leader, the batching worker, and the dispatcher. People master related occupations. In a half year it is possible to take a loader from such a brigade and make him into an excellent metal worker. In turn, metal-assembly workers have learned to drive motor carts and electric cars, have taken exams

in technical safety and have received diplomas as drivers. Nobody has to look for transportation workers any more, and nobody stands idle because of them. This unprestigious position has practically disappeared in the brigade. Having worked for a certain amount of time in it, the transportation worker masters the occupation of the metal worker, and participates along with him in the assembly of items.

Such a brigade is essentially not simply a production unit, but a production-economic unit. It has a plan for the production of products, a wage fund, and a bonus fund for meeting planning indicators, and it works under conditions of partial autonomous financing. Now the association is preparing to change over to complete autonomous financing. We are giving them the responsibility for material resources, having been convinced that the brigades can handle funds correctly. That is, it has become possible even at this level to coordinate all the main economic indicators.

In these brigades wages are paid according to the coefficient of labor participation. Thus the earnings not only of the basic piece-rate worker, but also of all other workers in the brigade are dependent on the final results that are achieved and on the labor contribution of each.

Certain managers are afraid of becoming dependent on the brigades. I think these fears are groundless. A manager does not become dependent if he has worked out a system of accounting, control, payment and norm setting for labor. Then, if a brigade leader unjustifiably demands an increase in the wage fund for the brigade, we can always say to him: look for technical and organizational solutions, because you are now receiving as much as the brigade has earned. Wages cannot be increased as a result of nonlabor incomes. This is the kind of income which I consider to be unearned progressive wages.

It seems to me that it is also psychologically better and easier to work with a collective than with individuals. But in doing this we must not create a situation wherein the gage maker Uncle Vasya or the tinsmith Uncle Petya will dictate their demands to us. It is necessary to give young people access to these jobs, or else the skilled worker will gain a monopoly over the given technological process, and then you will never get the upper hand. Such micromonopolies must be absorbed, and the brigade is the best means of doing this. Here the skilled specialist passes on his experience and the newcomer automatically gets used to what is going on next to him. In a word, when the brigade is placed within a certain framework of responsibility with autonomous financing, independence can do no harm.

We have also revised our views on technological specialization of the shops. Narrow specialization is becoming an impediment. The process of operational planning and control of production is becoming considerably more complicated. There is a significant increase in incomplete production and the volumes of intershop transportation, and also the warehousing work of the shops. Such concepts as fulfillment of contractual deliveries and observance of conditions for complete autonomous financing are losing their definition to a certain degree for a considerable group of workers, and they sometimes completely disappear from the field of vision. Therefore we have taken a course from comprehensive autonomously financed brigades to autonomously financed shop

\*complexes. The distinguishing features of the production-economic subdivisions should be: brigade labor is the predominant form of organization; a direct link between earnings, the labor contribution of each worker and the final result of the labor of the collective; material motivation of each for thrifty expenditure and savings on all kinds of resources per unit of output.

Two machine assembly shops have now been created in the association following this principle: the compressor shop and the shop for water cooling machines. The labor productivity in the comprehensive brigades of these shops increased by 20 percent during the 2 years of the 11th Five-Year Plan, and wages -- by 15 percent. An interesting detail is that the proportion of auxiliary workers in the comprehensive brigades has decreased by half compared to the actual number in the plant.

#### Even If You Cannot Be an Edison ...

I am especially concerned about a lack of initiative in engineering personnel. People assimilate knowledge, and then do not want to return it. A person will not move unless you set fire under him. Such passivity when there is a much greater potential is a very difficult and unpleasant characteristic in a young engineer. In my opinion, this is also a result of a lack of creative independence and responsibility, although there is also an obvious omission in their education in school, the institute, the production collective and the family. The effects of shortcomings are also reflected in the system of wages for engineers.

Not everyone can be an Edison, but every engineer should work creatively. In production there are too many bureaucrats with engineering diplomas in their pockets.

I think that decreased responsibility depends largely on the fact that here too we have narrow technical specialization. It distances the engineer from the final result and from responsibility for it. A person can intelligently draw a part or component and not even be interested in what it is need for, the result that will be achieved, or whether or not the design can be different and more effective. He does his part of the work well, and he has nothing to do with the machine as a whole.

We try to synthesize the knowledge of extremely specialized workers and interest them in the final results, and thus avoid passivity.

To this end, we are creating creative brigades, which work on imaginative subjects and comprehensive special-purpose programs. They include designers, technologists and economists. The leader of the brigade is appointed, and if it is a large special-purpose program, the brigade staff is also appointed by an order of the general director.

A certain responsibility and planning are attached to imaginative subject matter in the association, so that the people will see its significance. Suggested subjects are considered and approved, and a special division of the overall plan for developments is formed from them. Some subjects are included in other sections of the plan. In either case they are provided with

resources. The results of their implementation are reflected in the creative personal accounts and are taken into account when bonuses are awarded.

Growth Rates of Normative  
Net Output, % of 1980

1980	100
1981	105.8
1982	119.2
1983	125.5

Dynamics of Labor Productivity in Normative Net Output, % of 1980

1980	100
1981	105.9
1982	118.7
1983	128.1

We think that out of our 740 scientific research and planning-design personnel in the association, we have about 500 "pencils," that is, specialists who are participating directly in the creative process. About 400 people have personal accounts.

The leader of a creative brigade is granted certain rights. Although administratively he remains under the jurisdiction of the division chief, he is directly responsible to the management of the association for the special-purpose program or subject. He orders components and parts, and signs orders for materials and batching items. He is given special forms with a red strip for this.

The imaginative brigade determines its own time periods for carrying out the work based on its capabilities. Nobody imposes these time periods on it. And, as a rule, it is typical that the time periods turn out to be many times shorter than the amount of time allotted for carrying out similar developments that are planned. Independence gives rise to initiative and increases responsibility. In many cases machines developed by creative brigades are created on the level of inventions: for example, the sets of equipment for cooling milk and lubricants.

The imaginative subject matter and special-purpose programs make it possible to reveal man's creative potential and talent better. If an engineer has been in charge of a job two or three times, he is ready for promotion.

What are the incentives for this work? A special-purpose bonus is determined beforehand. The leader of the program is given a personal increment to his salary for the period during which he is in charge of the brigade. Because of the special-purpose approach, we have managed to obtain a large creative return from the developers and improve their incentives. While previously the amount of their bonuses amounted to 4 percent of their annual wages, now they amount to about 20 percent. Personal accounts have served as the basis for creating a special classifier for evaluating the activity of engineering and technical personnel, which has augmented certification with a more objective description of the worker's creative potential.

But still one cannot skip levels on the table of distribution or go beyond the framework of official salaries. In my opinion, wages for engineering and technical personnel are low. The prestige of design labor is declining. And if the association manager had the right to distribute the wage fund without looking at the table of distribution, he could reduce the number of designers by 30 percent and add to the earnings of capable developers, thus stimulating their creative activity.

But if the manager were allowed to carry out this kind of reorganization in the design services, he could make the decision with the guarantee that, if necessary, he could add specialists at his own discretion, within the limits of this same wage fund, of course. He would not keep unnecessary people, but would pay for the labor of those who were necessary and maneuver the number of personnel in keeping with the production need. But to do this it is necessary to have guarantees of independence within the framework of clearly defined state responsibility for the main indicators of the association's production and economic activity. Today he does not have such a guarantee.

"Ask for Two -- I Shall Give You Half!"

The association bears much more responsibility to the national economy than do the enterprises which comprise it. Previously, each organization did its part of the work and was responsible for it. The production complexes that were created on the basis of them took on all these tasks and goals. There was a considerable reduction of the number of enterprises that were at the level of the branch and subbranch. Their problems are solved in the association. Consequently, managers of associations should be granted greater rights and independence in decision making.

For example, 11 years ago a plant for refrigeration machines, a special design bureau for refrigeration equipment and a technological institute were created in our association. These planning-design and technological organizations were the head organizations in the branch. Thus the Odeskholodmash association, in addition to satisfying the needs of the national economy for certain kinds of refrigeration equipment and industrial air conditioners for agriculture, rail transportation, the coal industry, medical institutions and other branches, is now responsible for the level of technology in these branches. But, as before, one of the most difficult problems for the manager is still the problem of stimulating scientific and technical progress, since the financing of new technical equipment is too centralized.

As we know, in keeping with the decree on improvement of the economic mechanism of 1979, a unified fund for development of science and technology (YeFRNT) is being created in the branches. It is formed from deductions from the planned profit of scientific-production and production associations. The industrial ministries are permitted to transfer part of the YeFRNT to the all-union and republic industrial associations and large production associations and scientific production associations. But this is an exception and not the rule. One must ask for money for new technical equipment. You go with an open hand and you do not know whether the money will come to you or someone else. Therefore the production associations do not regard the YeFRNT as a guaranteed source of financing for new technical equipment.

Since you have to ask, you ask for more. Everyone has become accustomed to the fact that they will cut and reduce the amount and ask if it is necessary. Like in the children's story about Cheburashka: "Ask for two and I shall give you half." In essence, both sides know the rules of the game, and both act accordingly.

It seems to me that funds for the development of science and technology should be created in the associations and independent enterprises that are not included in production associations and scientific production associations, and that their amounts should depend on the results of economic activity. Then production would rely on itself, on its own forces, and would handle this fund more thriftily. Let us assume that a new set of equipment has been assimilated and put into series production. Its profitability increases with each subsequent year. The association can set aside part of the profit for the development and assimilation of other new machines.

Incidentally, the centralized unified fund for the development of science and technology has a fairly narrow purpose: financing scientific research, experimental design and technological work related to the creation of new models. Technical re-equipment, which has to be carried out in connection with the preparation for production of the new item, and partial reconstruction and new construction for these purposes are financed under different articles of the provisions. All the funds are assigned and dispersed. Each article has its restrictions and special purposes. Capital investments are received either by poorly operating enterprises which the branch is trying to assist or to those whole managers have the most clout. There are managers who play this game well. They spend all their energy on obtaining more money.

Earnings per 1 Ruble of  
Normative Net Output

1981	50.6 kopecks
1982	46.5 "
1983	44.0 "
(plan)	

Earnings per 1 Ruble of  
Commercial Output

1980	87.4 kopecks
1981	86.3 "
1982	85.3 "

There are sometimes such insurmountable obstacles that it is better to go around them than to try to get over them. It is necessary to take a risk. I think that there is not a single new idea which does not involve risk. But who can say where the line is drawn for risk that is motivated by production necessity? Is it not better not to create these unnecessary obstacles, not to place the manager in the position of an "honest thief" who has stolen nothing and taken nothing for himself, but still has violated some rule or side-stepped some instruction.

In my opinion, the main principle should be the autonomously financed responsibility of the enterprise: if the contractual commitments for deliveries are fulfilled and the money has been earned -- settle accounts with

the state from profit, and plan how the rest of the money can be used most expediently for the development of production and the satisfaction of the social needs of the collective.

But in fact, the number of planning indicators is increasing.

#### What Should Be Reported First?

Our association has been operating according to the normative net output since 1982, but they also ask about the "gross," "commodity" and sales, taking into account deliveries under agreements. It reports savings on metal and also savings on material resources as a result of the introduction of new technical equipment. Moreover, it is necessary to show the economic effect from the introduction of the suggestions of efficiency experts and inventors. The same figure for economizing on materials is calculated several times, as a result of which it is difficult to determine the actual savings.

There is also a multitude of indicators for labor and wages now: labor productivity, the wage fund, wages per ruble of normative net output or commercial output, the limit on numbers of personnel, the table of distribution, the number of administrative and management personnel (AUP)...One might ask if it could really be disadvantageous to the state if the association were to manage with fewer personnel within the limits of the wage fund when the situation with respect to labor resources is so bad. So grant the association manager the right to maneuver the numbers of personnel himself, so as to fulfill the plan, achieve an increase in labor productivity, and not overspend the wage fund! I assure you that staff excesses are simply disadvantageous to him. Why does he have to maintain superfluous administrative personnel instead of personnel who are employed in the output of products?! In this case the association will end up without a plan and without an incentive fund.

Incidentally, the increase in wages of piece-rate workers is not regulated by anybody, as long as they adhere to the principle of making sure that labor productivity increases more rapidly than wages do. But still, in essence, labor productivity increases as a result of the efforts of the entire collective -- mechanization and automation of production, replacement of outdated equipment, introduction of new technological processes, improvement of organization of labor and production, and so forth, while earnings increase only for piece-rate workers. The disparity between their payment and the earnings of auxiliary workers, engineering and technical personnel, and employees is increasing. Let us add to this the constant reduction of the numbers of administrative and management personnel, the same personnel whose numbers the enterprises and organizations annually receive assignments to reduce. Strict regulation of the managers in solving this problem causes a reverse reaction: to protect the AUP from having their numbers reduced. For they are very important workers for production: bookkeepers, finance experts, supply workers, and so forth. It is necessary to conceal them, and call them something else on the tables of distribution.

In order to prevent such situations, it is necessary to make it possible for production itself to manage its own labor resources by establishing only two indicators for it: labor productivity and the wage fund.

Many economic experiments have been conducted for improving administration. Why have they not been successful enough? In my opinion, because the departments themselves have violated their conditions. For those who introduced the Shchokino method, the reduction of personnel was included in the plan, but no mention was made of additional payments for expanding the zones of service. That is, the planning base was undermined, and, as before, planning proceeded from what had been achieved. Therefore, in my opinion, one of the most important conditions for the economic experiment which will begin on 1 January 1984 should be strict observance of its conditions by the branches.

The enterprises are also hampered by the fact that there are so many time periods for control: the 10-day period, the month, the quarter, the semester, the year. And, after all, the main things are the machines that have been ordered by the consumer. It is not easy to understand why, if a machine is delivered on the 30th, the production collective is among the leaders, but if it is delivered on the 1st, the sky will fall in on them. In our opinion, activity should be evaluated in terms of consolidated measurements: the fulfillment of orders for equipment, and, once a quarter or once a semester, in terms of the production volume (and not monthly, especially in machine building enterprises where the work on creating items does not fall into a monthly cycle). It is necessary to reduce the number of intermediate ends, and the fulfillment of the plan should be regarded as a running total.

I think that to take advantage consistently of the rights granted in the law on labor collectives will contribute to increasing the independence of the enterprises and develop economic thinking in the correct direction.

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## EKO PUBLISHES RESULTS OF 'LABOR DISCIPLINE' SURVEY

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83, pp 18-45

[Survey conducted and materials prepared by: from the section for complex socio-economic problems of labor of the scientific council for labor and social problems of the USSR State Committee for Labor and Wages -- L. E. Kunel'skiy, doctor of economic sciences, professor; from EKO -- B. P. Kutyrev, candidate of economic sciences (Novosibirsk): "Experiment in Controlling Labor Discipline"]

[Text] In his speech to Moscow machine tool builders, General Secretary of the CPSU Central Committee Yu. V. Andropov noted that urgent wording of the problem of labor discipline by the November (1982) Plenum of the CPSU Central Committee is a requirement of life. Without proper discipline -- labor, planning and state -- we cannot go forward. Discipline is a most important link in the chain of tasks for improving the quality of work, accelerating its rates, and reducing the cost of the production of products. And although everything cannot be reduced to this, it is precisely here where we must begin.

Additionally, it was emphasized that when one speaks about discipline, one has in mind the entire labor production chain. All efforts will be in vain if the developing struggle for discipline slides along the surface and is replaced by trivia. It is necessary to introduce order everywhere where working minutes are lost -- we are speaking about a serious attitude toward all aspects of production discipline, and it is necessary for the effects from raising it to be evident in all production units.

The fundamental question concerns socialist labor discipline, which is conscientious, filled with content and directly linked to the fulfillment of production assignments, and it concerns the basis for the formation of a creative approach to further theoretical investigation of the problems of socialist discipline, to its establishment and control of its practical activity.

Relying on the instructions of the November (1982) and June (1983) Plenums of the CPSU Central Committee, control of discipline should be arranged on principles of influencing all units, from the worker to the ministry, and all elements of the production process -- technology, material and technical

supply, design and so forth -- without reducing it to the disclosure and punishment for individual violations. We have leading workers who deserve honor and respect, but they alone cannot carry out the tasks that have been set. It is necessary for every individual to fulfill his production norm and his moral norm. Consequently, it is very important always to disclose everything that is useful in advanced workers, and the potential for transferring their achievements to the rest. This is the issue that is discussed in the decree of the CPSU Central Committee, the USSR Council of Ministers and the AUCCTU, "On Stepping Up Work for Strengthening Socialist Labor Discipline."

In past years EKO has published a number of large articles devoted to this topic, including on the experience in maintaining high responsibility and discipline in the Magnitogorsk Metallurgical Combine imeni V. I. Lenin (No 12, 1979) and the cultivation of a conscientious attitude toward labor in the Yaroslav Lakokraska Production Association (No 3, 1981). In the ninth issue for this year we published an editorial entitled "Increasing the Content of the Struggle for Labor Discipline." Previously, in the ninth issue for 1982, we familiarized the readers with a questionnaire distributed among a large group of interested people concerning the dynamics of labor discipline. Now, in order to expand the research on this important socio-economic problem, the magazine's editorial staff, in conjunction with the section for complex socio-economic problems of labor of the scientific council for labor and social problems of the USSR State Committee for Labor and Wages, has asked the directors of a number of large enterprises and production associations of the European part of the country and Novosibirsk to discuss the forms and methods of controlling labor discipline and the measures for reducing labor turnover that are applied in their collectives.

The questionnaire was distributed to the top managers of 100 industrial enterprises and production associations, including 30 in Novosibirsk, where the Institute of Economic and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences recently conducted a large-scale research project on labor turnover. The questions in the questionnaire were of the following nature: what factors influence labor discipline; what internal capabilities does the enterprise have to affect these factors; how is the control of labor discipline arranged; and how is the work arranged for educating working youth. A survey of the answers to these questions along with comments is presented below.

#### Production-Technical Factors and Labor Discipline

There is no doubt that technical equipment, technology, and the organization of production, labor and administration influence labor discipline in the most direct way. True, this influence is not simple. Sometimes the best examples of discipline are provided by those enterprises where the technical equipment is "of age" and the technologies are not the most modern. And conversely: in the new, excellently equipped productions, one unexpectedly encounters a lot of disorder, disagreements and violations of discipline.

But it is emphasized in the responses to the questionnaire how important it is in achieving high discipline to update the production staff and to improve

technical equipment and technology. The general director of the Rybinsk engine building production association, P. F. Derunov, for example, relates improvement of discipline precisely to technical re-equipment: labor turnover has decreased by more than half during the past decade and a half, and amounts to less than 5 percent. About 600 machine tools with numerical program control have been introduced in the shops. The proportion of mechanized labor in the total labor expenditures in basic production is 80 percent, and in loading-unloading and transportation work -- 90 percent. There are more than 50 robots and sets of technological robot equipment which completely replace the manual labor of the worker at the machine tool, press and casting machine. In many cases, the adjusters and fitters of the most complicated equipment and electronic control devices are workers with a higher and secondary specialized education.

The experience of the Rybinsk workers in introducing scientific organization of labor is widely known throughout the country. The working positions, at least in the main occupations, are organized according to standard plans and provided with convenient equipment and supplies, and special services deliver objects and implements of labor to them beforehand, before the beginning of the shift. A system of planned preventive service for the working positions has made it possible to reduce losses of working time sharply and to increase labor productivity. One more feature: the proportion of technically substantiated norms in the overall labor-intensiveness of the products is more than 80 percent. One of the results of the measures that have been taken is the reduction of labor turnover; 83 percent of the workers are satisfied with their work.

During the years of the 10th Five-Year Plan alone -- the deputy general director for economic problems of the Sumy Machine Building Association imeni M.V. Frunze, V. P. Moskalenko, announces -- labor turnover and losses of working time due to violations of labor discipline decreased by more than 30 percent. Under the current five-year plan the rates of this process are being maintained. An important instrument that made it possible to achieve such results was the comprehensive system for control of the effectiveness of production (KS UEP). One of its elements is made up of the progressive forms of organization and incentives for labor. Brigade organization encompasses more than four-fifths of all the workers.

Under the 11th Five-Year Plan it is intended to improve the administration of the association on the basis of standardization of the KS UEP. Within the framework of the functional subsystem, "Work with Personnel," normative documents are being introduced which regulate procedures for stabilization of the production collective, production and social advancement, occupational orientation and occupational placement. In order to evaluate the efforts of subdivisions for retaining personnel, the indicator of the "coefficient of adaptation" of personnel is being introduced. The leaders of subdivisions and collectives are informed of this and it is taken into account when determining the amounts of bonuses. It is the ratio between the number of people hired and fired during the first three years.

This example can be used as a illustration of the link between control of production and control of labor discipline.

The significance of collective forms of organization and incentives for labor was pointed out by many who responded to the questionnaire. The general director of the Uralelektrotyazhmarsh production association (Sverdlovsk), Yu. P. Glazkov, writes that the 11th Five-Year Plan began at a time when more than half of the workers had already been included in brigades that were working for the final results. One can judge the effectiveness of this form of organization from the work of the brigade which is assembling and welding the casings for aerial switches: throughout all the past and current five-year plans it has not had a single violation of labor discipline. In all the newly organized brigades, educational measures occupy one of the primary places: every case of violation is considered at a general meeting, and the coefficient of labor participation is calculated taking discipline into account. On the whole, there have been 30 percent fewer violations in brigades than among people working individually.

The Rostsel'mash association attaches primary significance to production factors in the control of discipline. During the years of the 10th Five-Year Plan alone they introduced 55 automated lines, 89 mechanized flowlines, and 347 units of progressive new equipment here. The level of inclusion of workers in mechanized labor increased by 11.2 percentage points. Under the 11th Five-Year Plan these indicators will be surpassed. In the plan for stabilization of personnel, one section is devoted to improving loading and unloading work and material and technical supply. These figures were announced by the association's general director, Yu. A. Peskov.

The director of the Mogilev Strommashina plant, A. P. Tarakin, and the chairman of the plant trade union committee, I. V. Kirilov, do not regard technical equipment, technology, and the organization of production, labor and administration as the main factors that condition labor discipline, but they cite figures concerning changes in this area. Thus the level of mechanization of labor has come close to the 90-percent point in basic production, and 80 percent in auxiliary production. More than 95 percent of the loading-unloading and warehouse work has been mechanized. All personnel at the plant have been relieved of heavy manual labor. It is interesting that young people are assigned to standard working positions, which are equipped fully in keeping with the requirements of scientific organization of labor and the norms for technical safety. This has a great educational effect.

The announcement of the deputy director for personnel of the Novosibirsk Elektrosignal plant, V. Ya. Yudin, can serve as a clear illustration of this. The stamping section here has been known for its success for more than 10 years. There is almost no labor turnover in it, and losses of working time and violations of labor discipline are considerably lower than in the plant as a whole. Such results can be explained largely by administrative solutions: the collective form of organization and incentives for labor includes masters and technologists in addition to the workers; it is also important that the principles of the Shchokino methods are strictly observed -- long-term normatives for wages.

Summing this section up, from the responses one can come to the conclusion that labor discipline should be determined by all the decisions that are made at the enterprises, including technical, technological, organizational,

economic and administrative. In other words, it is formed and should be formed in all the decisions that are made. Measures that are especially intended for increasing discipline are not enough. It is necessary to see this goal in each step of administrative activity.

### Social Policy and Discipline

Among the measures that determine the social policy of an enterprise, one usually includes the following: improvement of working conditions and social and domestic service, provision of housing and children's preschool institutions, improvement of health, and organization of recreation and leisure. The influence of these factors on labor discipline is recognized by all the executives who sent responses to the questionnaire. And it is characterized from two standpoints: whether or not the necessary effect was achieved.

Now about the social programs that were mentioned in the responses to the questionnaire. The Lipetsk Tractor Plant imeni XXIII s"yeda KPSS production association, with its elaborate social and cultural-domestic infrastructure, spends 7 million rubles a year on social development. As the deputy general director for personnel, A. P. Aver'yanov, writes, 2,500 people are treated in the dispensary during a year. Construction has been completed on a second building for the dispensary, which accommodates 200. A good deal of effort and money are spent on improving working conditions and increasing the content of work. And the number of people who leave because of unfavorable working conditions is steadily declining.

For the collectives of tractor builders the formation of a socio-psychological climate is also included in social measures. Research is conducted by the sociological service, and it also develops concrete measures for regulation. Command personnel have been made more responsible for labor turnover. This indicator is among the main ones for evaluating the production activity of the subdivisions. Cases of formalism and a rude attitude on the part of individual managers toward their subordinates, their needs and requests, are decisively eliminated. A situation of intolerance of violations of labor discipline is being created.

During the 10th Five-Year Plan losses of working time because of absenteeism decreased by 11 percent, and the number of people who had to visit the drunk tank decreased by 38.5 percent. This result was achieved by various measures, including fines, publicity of legal information, and the system for the adaptation of youth. In addition to this, A. P. Aver'yanov emphasizes the importance of disseminating the experiences of the managers of subdivisions which have achieved the greatest successes in educational work and in strengthening labor discipline.

Rybinsk engine builders annually receive 1,000 apartments. During the 10th Five-Year Plan almost a quarter of a million square meters of dwelling space were made available, and this was near the association. During this period the number of people who left because of the distance from their homes to their place of work decreased to five-elevenths of the previous number, and those who left because of a change in residence and the impossibility of

finding an apartment -- to five-sevenths of the previous number. Wages increased by 21 percent (with a 1.6-fold increase in labor productivity).

The services for the workers include a suburban recreation base, the largest pioneer camp in the oblast (in the autumn and winter it is a two-day house of recreation a palace of culture and technology, a house of books, a permanent hospital with a polyclinic which has the most modern medical equipment, and a multiprofile subsidiary farm. The association has two stadiums, an international class swimming pool, and ice skating rink, a yacht club, and a sports and concert complex with artificial ice which will accomodate 4,000 spectators. The convenient location on the Volga, the proximity of the water reservoir and the excellent climate -- all this makes it possible to do extensive health and physical culture work at any time of year.

These indicators, which were announced by the general director of the association, P. F. Derunov, could evoke this judgment: not everyone can follow the engine construction workers. What is true is true. But from the answers that were sent in it is clear that not a single enterprise is being inactive when it comes to improving working conditions, constructing housing, supplying the workers with food products, organizing recreation, culture and sports, and so forth. Of course, they can only do so much.

The Kupavna Fine Fabric Factory cannot be compared with the Rybinsk engine construction association in terms of size and financial power. But, as its director, Hero of Socialist Labor V. D. Yerofeyev, writes, the youth here have tried to construct a dormitory on the basis of standard plans for VUZes, which has a cafeteria with hot food, premises for study and rest, libraries, laundries and other auxiliary accomodations. Modern furniture and conveniences answer the young people's requirements for living arrangements.

The factory's housing supply amounts to 65,000 square meters. It is all modern and supplied with gas. The factory's four-story building for nonwork activities has a dressing room with showers, a well-equipped dining room, and a health point.

Every third worker annually receives a pass to a sanitorium for preventive treatment or dietetic nutrition, and up to 700 people receive passes to sanatoriums, houses of recreation, guest houses and touring trips. In addition to the pass, they are given rail or airline tickets. Each year up to 2,000 people take excursions to see the sights of Moscow and the Moscow area, and visit other prominent cities and cultural and historical centers of the country. The factory has a house of culture, three libraries, and a young technicians club. More than 1,500 workers use the sports complex.

Anyone who needs it can obtain a place for their children in one of the five children's combines. In the suburban pioneer camp, Lesnaya Skazka, 150 children take their vacations during each session, and in the urban pioneer camp, Veselyy uley -- 100. Each year 30 of the best students are sent to the pioneer camps of the Tekstilana enterprise (Czechoslovakia) and the Rikards enterprise (Hungary), with which the factory has concluded agreements for socialist cooperation.

From the answers that were sent in it is clear that usually some one kind of social measure is the object of special concern and pride on the part of the respondent. Thus the director of the Azot production association in Severodonetsk, B. N. Lishchin, discussing the acceleration of the construction of housing, children's preschool institutions and so forth, especially singles out the measures for improving health: a polyclinic for 600 visits a shift, a hospital with 400 beds, nine medical points in the production areas, a new therapy building with 120 beds, a preventive medicine sanitorium to accomodate 230, and a mud treatment and surgical complex with 240 beds. The majority of shops have modern nonwork facilities and hygiene rooms for women.

The association has almost 5,000 systems for automatic regulation of technological processes, 125,000 instruments and automatic regulators, and more than 11,000 anti-emergency protection systems. All this is to provide for labor safety and to make it easier. In 70 shops and divisions the control of technological processes is done from dispatcher panels, without direct contact with the technological equipment. The level of automation is approaching 100 percent.

It is understandable why, in his response, the general director of the Rostsel'mash association, Yu. A. Peskov, recalls, in addition to the construction of housing, children's combines, three schools, two vocational and technical schools, two consumer service combines, three medical treatment buildings, a swimming pool and handball court. The women's handball team is entering the highest league.

The chief of the division for labor and wages of the Sevastopol' Marine Plant imeni S. Ordzhonikidze production association, V. V. Orlenkov, and the chief of the personnel division Kalush Khlorvinil production association, N. F. Vorob'yev, give their own examples and figures. Thus among the Sevastopol workers during the Tenth Five-Year Plan housing conditions have improved for 2,000 families, and they have constructed two schools, four children's combines, a children's movie theater, a public center with a movie and lecture hall, a communications center and a branch of the children's polyclinic. Under the 11th Five-Year Plan it is intended, in particular, to change about 500 workers over to mechanized labor.

Since the beginning of the 11th Five-Year Plan the association has expanded competition under the motto: "Assignments of the five-year plan -- on time, with stable composition of the brigades, and without violations of labor discipline and public order." It includes 383 brigades, with a total of 3,660 people. The competition has produced an appreciable result in strengthening discipline.

But there is another kind of connection between social measures and discipline. For example, A. P. Aver'yanov convincingly shows a reduction in labor turnover in the Lipetsk Tractor Plant imeni XXIII s"yezda KPSS production association. From 1970 through 1980 it decreased from 12.5 to 8.6 percent or 1.3-fold. People practically never leave because of a lack of places in children's preschool institutions, the distance from home to their place of work (after the construction of a second bridge across the Voronezh River), working conditions (several metallurgy and machine assembly shops have

been changed from a three-shift schedule to a two-shift one), or dissatisfaction with conditions, norm setting or organization of labor and wages.

But since the end of the five-year plan labor turnover has begun to rise again because families are not provided with dwelling space. The fact is that since 1977 the ministry has been constantly reducing the association's funds for housing construction. During the 10th Five-Year Plan, it was intended to construct 76,600 square meters of dwelling space, but actually only 47,500 were introduced. It is not surprising that people are leaving for enterprises that are growing and provide a chance to obtain an apartment more quickly.

Let us conclude this section with the statement of the director, V. D. Yerofeyev: "Continuous improvement of production, labor and administration, the creation of favorable conditions for labor and life, the inculcation of collectivism, and individual work with people -- these mean the formation of the labor discipline which we need." Hence we come to this conclusion: No matter which decisions are made in production, all of them have a "disciplinary" effect, all of them form discipline in one way or another. But some decisions and actions affect it directly, while others affect it indirectly. We have considered above mainly what is being done at the enterprises for a mediated influence on discipline. Now let us turn to direct control of it.

#### Direct Methods of Controlling Discipline

There is no doubt that it is hardly possible to draw a sharp boundary between measures for direct and indirect influence on people's labor behavior. For example, the deputy director for personnel of the Dneprovsk Machine Building Plant imeni V. I. Lenin, A. I. Il'in, recalls the Dnepropetrovsk "firm" means -- the system "Your Mood" and "Job Responsiveness," which was introduced in 1973 as a result of developments of the sociological service. Each worker can call on the telephone and present his concerns and receive an answer and a solution to the problem. At first glance, this is something like a collection of complaints and suggestions, with the reaction to them resulting in some kind of change. But one of the goals of the system is to control the style and work methods of management personnel. Does this produce a direct or an indirect influence on discipline. While in 1973, 20 percent of the workers indicated an incorrect work style on the part of the management, in 1980 only 1.3 percent of the overall number of signals through the "Your Mood" system did. In 1972, 11 percent of those who left did so because of conflicts with management, and in 1980 only 0.8 percent of the overall number of workers who left the plant did so because of this.

Another example. In the dormitories of the Kupavna Fine Fabric Factory there are rooms of parents. The father or mother of a young worker is invited for a conversation -- the factory needs to know more about the worker's character and inclinations and to clarify the mutual demands of the parents and the administration as well as complaints. No, nothing bad has happened. The parents are invited to make sure that nothing bad does happen. Or another case: the work day of the director, V. D. Yerofeyev, begins with receiving information from the chiefs of production, the housing and municipal division,

and the village police department concerning the situation: where is it possible to find violations of labor discipline and law and order, where are the conditions ripe for this? In which category is this action included -- direct or indirect influence?

It is equally difficult to draw a clear line between prevention and "therapy." "Therapy" is the direct reaction to a violation or a positive action in the form of a punishment or encouragement. Punishments as "therapy," one after another, clearly illustrating their irreversibility, become a preventive measure which wards off repeat violations. The situation is similar with respect to encouragements.

Let us now try to show which punishments and encouragement are applied at the enterprises that responded to the questionnaire. We are speaking, naturally, not about general forms which are known from labor legislation, but about their concrete application.

Here is what A. P. Tarakin and I. V. Kirilov note: "At the Strommashina Plant, in order to ensure labor discipline, we use the most varied forms and methods, including incentives, on the one hand, and strict punishment, on the other." Thus when establishing the material incentives for leading workers, we take into account their length of continuous service at Strommashina. Lengthy labor activity gives workers the right to take advantage services of the plant recreation base free of charge, priority in obtaining passes to sanitoriums and houses of recreation, and so forth.

The personnel division has introduced a special card catalog to keep track of punishments. All cases of violations must be considered in the labor collectives. Measures of influence include: the denial of the title of shock worker of communist labor, transfer to a lower-paid job for 3 months, and deprivation of the current bonus and "13th wage." During the rest of the year after the violation the worker is not usually transferred to a higher-paid job and is not promoted in rank; violators are not permitted to combine jobs, and they are not given passes to sanitoriums, the plant recreation base or house of culture, and they are not given paid vacations; they lose their turn on the lists for obtaining housing and applications for improving housing conditions are denied. When staffs are reduced, these workers are the first to be let go. In addition, there are discussions in meetings and in the press. As we can see there is a large selection of measures. True, it is necessary to clarify positions: "Punishment is the last resort. It is important to create conditions so that it is not necessary to turn to punishment."

The textile workers of the Kupavna Fine Fabric Factory have many incentives (incidentally, the director does not mention punishments). And they are announced festively. The ritual for awarding the "13th wage," for instance, includes presenting a special envelope which is then kept in the family. The announcement is placed in the envelope. On the Day of the Light Industry Worker, the titles Veteran of Labor and Key Worker are conferred (with a monetary bonus), producers of high-quality work are honored, and young workers are awarded certificates of mastery of their occupations. They are always trying to update the forms of incentives at the factory so that they will not lose their effectiveness.

The Uralelektrotyazhmarsh production association has taken up the initiative of the metallurgists of the Severskiy Turbine Plant for collective material and moral responsibility for violations of labor discipline. The initiative has been supported by 24 shops, 25 sections and 187 brigades. Assuming responsibility for violations of labor discipline is encouraged by increasing the "13th wage" by 10 percent. A brigade which has no violations during the course of the year is awarded the title "Collective of High Labor Discipline."

Among the means that assist most effectively in reducing labor turnover and strengthening labor discipline, the deputy director for personnel of the Novosibirsk Elektrosignal plant, V. Ya. Yudin, includes constant information about the movement of personnel through the subdivisions of the plant and the deprivation of violators of labor discipline of their remuneration for the results of the work (the monthly bonus, apartments, the "13th wage," and additional payment for length of service).

We have deliberately retained the wording of "deprivation of remuneration for the results of the work" in order to show that many punitive systems are not logical enough. The fact is that one cannot be deprived of that which he has earned. Remuneration should be given to people who deserve it. Obviously, it is more correct to put it this way: the violator does not deserve incentives in the form of the current bonus or the "13th wage." He does not deserve it and therefore he does not receive it.

It should be noted how important it is from the psychological point of view to formulate incentives and punishments correctly. Certain respondents see no difference between "not credit" and "deprive." But the majority do not agree with them: remuneration for services leads to increase, while punishment evokes the fear of making a mistake. But here "one should not be guided by fear." Interesting observations about the effectiveness of punishments and the enthusiasm for this form were made in Uralelektrotyazhmarsh. As Yu. P. Glazkov writes, the association especially takes into account and analyzes such an indicator as the number of punishments per 100 incentives. This investigation conducted in nine shops of the head plant produced the following results: In shops No 12 and No 22 there were the fewest penalties -- 9, and shops No 2 and No 16, the most -- 37 per 100 incentives.

The system of moral incentives in shop No 22 is distinguished both by the diversity of forms of incentives for leading workers and by the influence on violators of discipline. The degree of development of these forms significantly increases the effectiveness of the incentives. The shop has the lowest proportion of violators -- 5 percent. And in first shop where, conversely, the number of penalties is about half the number of incentives, the system of moral incentives is not distinguished by its diversity (and 80 percent of the punishments are in the form of reprimands in orders), violators comprise almost 40 percent of the collective. The contrast in the effectiveness of the two systems is clear: an emphasis on punishment does not produce the desired results.

## Work With Personnel

The personnel policies of the enterprises that participated in the survey are distinguished by a great diversity of forms, methods and means. The experience of the Kupavna workers is especially interesting. Labor turnover is not a problem at the factory; its indicator is 4 percent, and 30 percent of the workers are under 30 years of age. And this is true in spite of the fact that Kupavna is just a stone's throw from Moscow, and there are other enterprises and scientific research institutes nearby .... But, as V. D. Yerofeyev writes, one cannot but take into account the fact that the stability of the collective is based on workers who came immediately after the war, and now, one after another, they are going for a well-deserved rest. The occupation of the textile worker is not one of the easiest, and therefore it is necessary to attract youth to it and train them ahead of time.

On the basis of the training course combine and the secondary schools of the village, a department has been created for occupational orientation of youth in the fifth-tenth grades. During the course of a year, more than 300 people study here twice a month. The classes are held in the economic information office and in the factory's shops, club and museum. They are conducted by specialists, executives, representatives of social organizations, labor veterans and leading production workers. Since 1975, on the basis of comprehensive plans for occupational orientation, the factory and schools of the village have been annually concluding agreements for conducting occupational orientation and production training for students in the ninth and tenth grades.

The students visit the shops twice a week: they study theory for 2 hours and they work at the machine tools for 4 hours. They are assigned to brigades where they work under the supervision of an instructor of production training. During the difficult summer period they render essential assistance in the fulfillment of production plans. By an order for the factory, measures have been taken to provide for normal work and leisure of the students during the "fifth quarter." There is competition for the title "Best Student in Production Training" and conditions have been worked out for a competition for labor mastery. All this contributes to reducing the dissatisfaction with their occupations on the part of future spinners, winders and weavers.

The factory is actively shaping public opinion regarding the need to constantly raise the level of education and skills, for which incentives are also provided. During 3 decades, on the initiative of the party organization, with the approval of a joint meeting of the board of the USSR Ministry of Light Industry and the trade union central committee, more than 200 workers have acquired higher, secondary, and secondary specialized education without leave from production. They were the ones who formed the technical services, the branch assortment laboratory, and so forth. The system of promotions within the factory is strictly determined.

The Dneprovsk Machine Building Plant imeni V. I. Lenin also relies on social and occupational orientation of youth. This is natural: almost 1,500 young workers and more than 200 young specialists come here each year. Each year these organizations draw up joint comprehensive socio-pedagogical programs.

The material assistance from the plant for schools and technical schools under its patronage exceeds 100,000 rubles a year. Each year these organizations draw up joint comprehensive socio-pedagogical programs. The plant office for occupational orientation handles up to 5,000 students. The office includes three physiologists, a psychologist and a pedagogical expert. The five schools under the plant's patronage and 12 nearby schools hold special-purpose excursions and competitions in various occupations for students of the sixth-tenth grades. The result is that 97 percent of the young workers who have passed the investigation and received recommendations do not subsequently change their chosen occupation. During the first year of independent work, the plant supervises the adaptation of the young people.

"The base for training young workers," write the deputy director for personnel, A. I. Il'in, "is a training-production shop which has modern equipment and is autonomously financed. Technical means and new methods are used extensively. The system of programmed training that was developed by the department of pedagogy and pedagogical psychology of Moscow State University makes it possible to reduce the time periods necessary for mastering a number of operations to two-thirds - one-half the previous amount. More than 1,000 mentors supervise 1,400 young workers. Every second worker increases his qualifications each year.

The director speaks personally with people who have completed the VUZ, and his deputy director for personnel speaks with graduates of teknikums. The probation period for young specialists includes a 2-week training period of 72 hours. During the probation period each new worker is assigned an experienced manager as a mentor. The organization and the course of the probation period are discussed by the council of young specialists and at meetings with the deputy director for personnel; those who have passed the probation period successfully are included in the reserve of management personnel. Socialist competition has been developed among young specialists. Scientific and technical conferences and reviews of scientific and technical work have become traditional. After 3 years, 98 percent of the young specialists are assigned to the plant.

Systematic training has been organized for specialists in the reserve. The qualifications of engineering-technical and management personnel are increased every 3-5 years, including organized advancement of technical and economic knowledge in the plant itself.

The hiring procedure has been revised. Previously, the plant lost more than 200 people a year just during registration, but now these losses have been eliminated. The return of youth to the plant from the Soviet Army has increased from 30 percent in 1972 to 70 percent at present. These results are explained by the effect of the "Your Mood" system. And this system is only one of the numerous elements of the plant's personnel policy, which includes selection, placement and education of workers, managers and engineering and technical personnel as well as socio-psychological methods of managing the collective.

As the deputy director for personnel and domestic services of the Voronezh Synthetic Rubber Plant imeni S. M. Kirov, Yu. A. Derkachev, notes, control of

discipline is based on an effective system of cultivation of the individual by the collective. Special emphasis is placed on socialist competition. Since 1969 the plant has been conducting review-competitions for labor discipline and social order. In order to manage them, to fight against drunkenness and alcoholism, and to prevent violations of law, a plant council for prevention has been created. The results of the review-competition are summed up each quarter with the approval of the trade union committee. According to the results, an order is issued, which analyzes the condition of labor discipline, and measures are taken against legal violations. Every Tuesday is a day of discipline. At the meetings they not only discuss the violators, but also hear from the chiefs of the shops where they work and the chairmen of the shop committees.

Such councils exist in all the shops and sections, and they are headed by the shop chief or their deputies. They include a total of more than 200 of the best social activists. Conferences and seminars are held with the chairmen of the shop councils no less frequently than once a quarter. Here they sum up the results of their work and set its main directions. Violators in the shops are judged in comrades' courts and a shop and shift meetings. It is also important that they are influenced not by the administration, but by the collective.

The plant council of mentors develops quarterly plans. A special department has been organized for training at the plant university of communist labor, scientific and technical conferences are held, and the best mentors are awarded the certificate of honor and the badge "Excellent Worker of the USSR Ministry of the Petroleum Refining and Petrochemical Industry."

In addition to measures for developing labor discipline, particularly various forms of criticism of violators, an important place is assigned to legal education. In addition to maintaining the legal service and the plant office for political education, the council for prevention has a day of legal propaganda each quarter: 25-30 responsible workers of the oblast justice division, the procurators office and the rayon internal affairs division give lectures and consultations on many branches of the law and conduct seminars with representatives of comrades' courts. Such a measure as a public plant court for people who are regularly guilty of being intoxicated and violating the law has also become a part of the practice. No less than 500 people attend it: chairmen and members of comrades' courts, representatives of management and public organizations of the shops, and workers. As a rule, the rayon procurator also participates in it, and he gives his conclusion.

Violations of labor discipline have decreased by almost half during the past decade. Violators comprise less than 3 percent of the workers.

The statement of Yu. A. Derkachev contains many interesting facts and figures. For example, young workers who have studied in schools for working youth and whose length of service has reached a year are paid the "13th wage" while all others must have the regular amount of work tenure to receive this remuneration.

The same can be said about other statements. Thus in the Uralelektryazhmarsh association a great deal of attention is devoted to organizing constant control over discipline, and accounting for and analyzing all kinds of violations of it -- absence, tardiness and so forth. The plants keep official journals to keep track of violations and measures that are taken against them. For example, the head plant keeps the journal, "Violations of Pass Conditions." The shops have these journals as well. Public forms are used in all this work: no less frequently than twice a month there are inspections of detachments of the "Komsomol Searchlight."

In 1976 at the head plant of Uralelektryazhmarsh the public created a disciplinary commission to fight against drunkenness. It included labor veterans, workers of the personnel division and the guard, representatives of the people's militia and the operational Komsomol detachment, and a correspondent from the plant large-circulation newspaper.

The chief of the personnel division of the Kalush Khlorvinil production association, N. F. Vorob'yev, thinks that labor discipline is strengthened above all by the Shchokino method, which has been extended to the majority of the shops. The work of public personnel divisions and comrades' courts has turned out to be effective. The administration and public organizations attach a great deal of significance to educating workers in their places of residence as well. A production subdivision is assigned to each dormitory, with the task of rendering assistance in organizing the leisure of youth and seeing about improving living conditions.

A decisive battle against violators of discipline and public order, and strict accounting -- such is the rule in effect at the Mogilev Strommashina plant. The personnel division has introduced a special card catalog of violators in the various divisions, shops and sections. All cases of violations must be reviewed in the labor collectives. All the main shops have introduced narcological posts and introduced a card catalog of people who are inclined to abuse alcohol: preventive work is done with them. The council for prevention holds meetings directly in the shops, and invite narcologists and representatives of the procurator's office and police agencies to attend them. On pay days they regularly inspect the work of the second shift and check for order in the dormitory. No less than three times a month the personnel division checks on observance of the schedule of the working day.

Indicators of discipline have been included in all the guidelines on socialist competition and bonuses. Each month at conferences that are held with the director every 10 days the question of the condition of discipline is discussed.

A. P. Tarakin and I. V. Kirilov also describe their work with youth, who mainly augment the Strommashina collective. The plant has entered the all-union review of working conditions for youth. The shop collectives get to know the future workers during their production practice. After the graduation examinations, the chief of the personnel division is authorized by the plant to receive the personal files of the young workers who are being sent to the plant. The masters of production training bring them to the personnel department where they are registered for work and distributed among

the shops. A representative of the plant welcoming committee has conversations with them. A visit to the plant museum is a must. The young workers have their own competitions for occupational mastery, other competitions and legal propaganda.

The deputy general director for personnel, V. Krishchynas, writes about the peculiarities of personnel work in the work in the Vilnius Fuel Equipment Plant imeni 50-letiye SSSR Production association. First of all he notes the efficiency in the planning and distribution of duties and functions. Plans are drawn up for groups of workers, which makes it possible to have greater differentiation in all forms and methods, to determine those responsible in the subdivisions and social organizations, to set deadlines and to make sure that they are met. Managers answer for their work with personnel to the general director or at meetings of the party committee and party organizations. There are comprehensive inspections of the condition of labor discipline and the stability of the collective.

The activity of councils for preventing legal violations is considered to be the most effective form of strengthening labor discipline in the association. Then come measures for the adaptation and retention of youth in production. The system of adaptation includes every new worker under 30 years old and is in effect during the first year. People authorized to work for adaptation and mentors for the youth are appointed in the collectives.

The director of the Severodonetsk Azot production association, B. N. Lishchina, describes such forms of controlling discipline and reducing labor turnover as work with people who are being discharged (conversations with them in the commission 1-2 weeks before they leave) and improvement of the personnel service. Additionally, they hold in-person strategy sessions during which they give a mandatory analysis of discipline and hear reports from heads of both leading collectives and those which are behind. Thus at one of these sessions, two poorly operating shops were subjected to critical analysis: the shop for steam supply and the shop for chemical treatment of water. After the necessary measures were earmarked, the annual labor turnover in them decreased from 8.5 to 4.6 percent and from 12 to 6.9 percent, respectively. Strategy sessions have become a unique form of exchange of opinions.

Thus in the responses one can see a multitude of interesting approaches to solving the problem, and the effect that is achieved can serve as proof of their viability. For instance, although the rates differ, personnel turnover is decreasing: for some, for example, the Rostsel'mash production association, from 21 to 14 percent, and for others, for example the Kupavna Fine Fabric Factory -- from 8 to 4 percent. True, the deputy general director for personnel of the Leningrad Optics and Mechanics Association imeni V. I. Lenin, A. B. Solov'yev, notes that "the tendency toward improvement of labor discipline is still not significant enough," but it is important that such a tendency exists.

The majority of those questioned understand labor discipline as a subject which requires constant attention. Factors which affect its condition in one way or another change. Thus when housing has been constructed people no longer leave because of a shortage of it, but then the importance of working

conditions increases. Therefore the enterprises are arranging systematic accounting for cases of violations of discipline and increased turnover, and they are trying to figure out what causes them: for these purposes they use automated control systems, conduct sociological research, and so forth.

The systematic, comprehensive approach to labor discipline should be supported. On the one hand it is understood as comprehensive accounting for and analysis of any and all violations, the combination of moral and material incentives and penalties, and preventive measures. The participation of local soviets of people's deputies in this work has increased. On the other hand, and this is especially valuable, the systematic approach means that discipline and labor turnover are considered not in and of themselves, but in their interconnection with the other conditions and factors in production, labor and administration. Hence the constant attention, for example, to raising the level of mechanization and automation, improving conditions for labor and life, and improving social and cultural services. As was pointed out in the speech by Yu. V. Andropov at the June (1983) Plenum of the CPSU Central Committee, the most immediate goal is primarily to bring order into what we have. He emphasizes the need of the present and the program task of the future: to provide for well arranged operation of the entire economic mechanism. Such is the place allotted to the principle of system and comprehensiveness in the approach to labor discipline.

The struggle against violations makes it possible to change over to preventing them. Councils for prevention meet regularly, and when discussing and analyzing already closed cases, they develop measures for preventing them. The significance of this work is obvious; it makes it possible to change over to a planned basis for the struggle to strengthen labor discipline and extensively enlist in it leading production workers, labor veterans, and the production aktiv of the associations and enterprises. In particular, the combination of incentives and penalties has become more flexible.

It is necessary to create conditions -- economic and organizational -- which will stimulate high-quality, productive labor, initiative and enterprising. And, conversely, poor work, inactivity and irresponsibility should be reflected in the most direct and irreversible way in material remuneration, the job situation and the authority of the workers. These are the conditions that were discussed by the directors and other managers in their responses.

In the work of General Secretary of the CPSU Central Committee Yu. V. Andropov, "The Teachings of Karl Marx and Several Problems of Socialist Construction in the USSR,"\* he discusses the need to take into account the entire complex of interrelations in the labor process. Here he has in mind primarily consistent strengthening in all spheres of the national economy, in the words of Marx, "regulation and order," which he considered to be forms of "social consolidation of the given method of production." Labor discipline pertains directly to what has been said. The answers to the questions on the

\*KOMMUNIST, No 3, 1983.

questionnaire show that in the national economy there is a fairly large amount of experience in strengthening discipline, which should be utilized on a large scale, in all production collectives. It is precisely by applying all the best and developing it further that it is possible to carry out the tasks that have been set for an all-around increase in discipline and order in all units of the national economy.

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INSTITUTE ECONOMIST DEPLORES CONTINUING WASTE OF NATURAL RESOURCES

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 46-56

[Article by V.V. Kuleshov, doctor of economic sciences, Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk): "You Have Not Saved? Very Bad!"]

[Text] The magazine is introducing a new column -- "Anatomy of Losses -- A Guide to Reserves." One can understand its origin. At recent plenums of the CPSU Central Committee -- the November (1982) and June (1983) -- it was emphasized that one of the major tasks in the area of management is to economize on everything, from a ton of metal to a kilogram of bread. Such a statement of the problem makes it necessary for us to change over in the future to more efficient technologies, and today, immediately, to turn to thriftiness, assiduous economizing and precise accounting. In the article published below, Doctor of Economic Sciences V. V. Kuleshov writes that for economical expenditure of resources one frequently needs neither significant capital investments, nor a serious restructuring of production, nor large labor expenditures. One needs elementary order and an internal readiness to bend over in order to pick up what is lying around at one's feet....

In introducing this column the editors are counting on help from the readers: questions of economical management concern everyone.

The decree of the CPSU Central Committee and the USSR Council of Ministers, "On Stepping Up Work for Economy and Efficient Utilization of Raw, Fuel and Energy, and Other Material Resources," of 30 June 1981 points out the need for a decisive change in all planning and economic activity and the development of science and technology in the direction of more efficient utilization and economy of material resources. Economic development should be oriented toward making sure that the results of production increase more rapidly than material expenditures do.\*

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\* Collection of Decrees of USSR Government, 1981, No 20, p 518.

Under the current five-year plan an increasing number of enterprises are utilizing resources efficiently. Still, as was noted at the November (1982) Plenum of the CPSU Central Committee, reserves for economy and thriftiness are being put into action slowly. The proportional material-intensiveness of products is practically not decreasing. As before, the plans are being fulfilled at the price of increased expenditures and production outlays.

#### Everything Has Its Limit

Far from all enterprises are fulfilling planned assignments for economizing on material and labor resources. And frequently this is not because work is not being done in this area. The inertia of economic thinking consists in that it seems to many managers that the country is rich, it has immense potential, and the shortage is only a temporary difficulty.

Indeed, the country's national wealth has reached a total of 3,000 billion rubles (not counting land, mineral resources, timber and water). Fixed production capital comprises two-thirds of it. Material circulating capital exceeds 500 billion rubles. The daily expenditure of energy, fuel, raw materials and processed materials -- 1.5 billion rubles -- is frequently used as an indicator which demonstrates the country's economic development. But perhaps it is necessary to spend less and obtain a greater return?!

Concentrated on the country's territory are 57 percent of the world supplies of hard coal, 41 percent of the iron ore, and 88 percent of the manganese. But the indisputable fact that nature has given our country its fair share sometimes creates the illusion that the resources are unlimited. But, on the contrary, they are limited in terms of the long-range future.

For each natural resource one can calculate how many years it will last with the scale and rates reached by the extraction branch. In the extraction industry, 30 percent of the fixed production capital, 18 percent of the workers and 40 percent of the capital investments are used to obtain initial raw material. The managers of these branches show a need for even greater capital investments because it is necessary to assimilate new, relatively poor deposits which are hard to get to, and it is necessary to dig more and more deeply into the earth.

Let us recall that under the 9th Five-Year Plan the volume of deliveries of initial raw material increased by 24 percent, under the 10th Five-Year Plan -- by only 10 percent, and in 1981-1982 the volume of output of the extraction industry did not increase. Thus the growth rates of natural resources have dropped, and now, probably, they are stabilizing on one level, at least for many kinds of raw material. This makes it necessary for the processing branches to utilize raw material more efficiently, to apply progressive technologies, and to produce more economical items.

The country has positive experience in this. All of the electrical equipment industry, for example, for 2 years has been increasing the output of products with the same consumption of resources. Another positive example is the development of branches of the fuel and energy complex, for which high output-

capital and capital-output ratios are typical. We have the smallest expenditure of conventional fuel per 1 kilowatt-hour of electric power in the world: 328 grams. And at the best stations it is even less. By 1985 this expenditure in the country as a whole should decrease to 319 grams, which will produce a savings of 9 million tons of conventional fuel a year. If we had not been reducing the energy-intensiveness of products since 1965, at the modern level of the national income we would require 300 million more tons of conventional fuel.

But expenditures on the fuel and energy complex are still fairly high, and, moreover, they are rapidly increasing. For its development, directly or indirectly, we use 65 percent of the pipes produced in the country, up to 20 percent of the other products from ferrous metallurgy, 15-20 percent of the copper and aluminum, 13-16 percent of the cement, and one-sixth of the gross output from machine building.

The implementation of measures for reducing material resources, which are planned in all branches, will cost the state half as much as an equivalent increase in the extraction of fuel, raw material and other materials. The funds invested in renovation of production processes in order to reduce the consumption of energy are recouped in less than 2 years, and expenditures on the assimilation of new sources of energy -- in more than 15 years. So efficient utilization of the wealth accumulated in the country depends largely on intelligent limitation of consumption. This is not only far-sighted, but is also less expensive than increasing the extraction of raw material.

#### Where Do We Lose Most?

Actually, there is not a single branch of the national economy that does not have losses. Even with the so-called waste-free technology there are wastes, which, true, are incommensurably small as compared to ordinary technologies. The imperfection of the equipment, the poor quality of materials and their processing by traditional methods produce completely objective losses. To prevent them is the business of scientists, designers, technologists and managers. Such is the algebra of economics. At the same time, in all branches there are losses which can be calculated with arithmetic, and elementary operations for protecting socialist property are sufficient to eliminate them.

BREAD. "A slice of well baked wheat bread is one of the greatest inventions of the human mind," wrote K. A. Timiryazev. Well, since this is such a great invention, our attitude toward it should be cautious, extremely precise, and as thrifty as possible. The consumption of it for food is at the level of 36 million tons a year, and the average annual per capita yield of grain under the 10th Five-Year Plan reached 804 kilograms, which is twice the average annual per capita level for the population of the planet.

This abundance of bread "enables" us to throw away about 1 million tons of the bread that is baked in the country each year just because of mold. We console ourselves by saying that food wastes are used for feeding livestock so that leftover bread is not wasted. But it is prohibited to ship food wastes and

feed them to livestock without preliminary thermal processing, and so far there are not enough shops for this kind of processing. In places where food wastes are sent for livestock anyway, this prohibition is ignored.

On private farms the livestock are most frequently raised not on wastes, but on grain that is purchased in stores. And this is not only because grain is less expensive (1 kilogram of rye grain costs 12 kopecks, and 1 kilogram of mixed feeds -- 18). There are cases where mixed feeds are offered for sale, but they are not bought because the people are relying on public mixed feed resources in the cow barns and pigsties. But still every fifth family in the country (according to the author's calculations), and in Belorussia and Estonia, every fourth family, purchases grain for animals. The more so since certain grain plants produce large quantities of low-grade grain. According to the author's calculations, about 5 million tons of grain go for feeding livestock.

Grain consumption is inevitable in public and private animal husbandry, but in what amounts? For hogs, 60-80 percent of the ration is grain, and for poultry -- 90 percent. In public animal husbandry they expend 120 million tons of grain\*, or 8 kilograms per 1 kilogram of meat, even counting all the meat that is produced in the country (public animal husbandry produced 70 percent of this volume). In Hungary they expend 4 kilograms of grain per 1 kilogram of meat. Why are our expenditures so high? The fact is that the grain is fed in unenriched form. We still do not have enough enterprises for enriching forage grain. Therefore losses during direct feeding of livestock have reached 17 million tons (according to the author's calculations).

All these large losses of grain can be eliminated both technologically and organizationally. Quite recently the country exported 6.8 million tons of grain, and imported only 0.2 million tons. This was in 1960. At that time the grain yield was 125.5 million tons, and under the 10th Five-Year Plan the average annual yield was 200 million tons. In the most productive year, 1978, grain imports from the United States alone amounted to 14.3 million tons.\*\*

With good conditions for economizing on grain and products made from it, and above all with an orientation toward enriching forage grain, imports could be sharply reduced with a simultaneous increase in consumption.

Losses of grain begin in the fields, and continue during its transportation and storage. There are losses in our milling industry, the largest in the world. For example, according to technical specifications, there can be up to 10 kilograms of flour residuals in the mills. But in fact each mill discards and throws away 40-50 kilograms of flour. There is also a good deal of waste in the bread baking industry. But the losses in the sphere of production are

\*ZA RUBEZHOM, No 7, 1982.

\*\*"Argumenty I Fakty," Bulletin of the All-Union "Znaniye" Society, 1980, No 3 (27).

still less than in the sphere of consumption. True, the division of these two spheres is arbitrary, because we all recall the long discussions about reducing the proportions of buns and rolls, about creating equipment for storing fresh bread and about utilizing stale bread, but such suggestions are realized slowly. For example, in September 1981 the Shchokino bread combine was one of the first in the branch to bake bread in small containers. In the words of the first secretary of the Shchokino CPSU Gorkom, G. Grotseskul, the effect was immediate: in 1981 the savings of bread amounted to 336 tons, and in 1982 -- 509 tons. But the combine's collective fell into a difficult situation because the commercial output is planned in tons. The plan was no longer fulfilled, although planning was simultaneously conducted according to the normative net output. The director was punished, the collective ceased to receive a bonus, and they did not even receive a bonus for economizing on bread.\*

"While increasing grain production in all ways," it says in the Food Program, "it is necessary to show constant concern for economical and thrifty expenditure of food and forage grain, bread and bread products." The seriousness of the situation is shown by the fact that the agenda of the meeting of the Presidium of the USSR Supreme Soviet on 12 January 1983 included the question of letters from workers regarding a thrifty attitude toward grain. The Presidium of the USSR Supreme Soviet made it incumbent on the corresponding state agencies and organizations to take additional measures to provide for the implementation of previously adopted decisions concerning efficient utilization and other food products. And such measures are being taken on a statewide scale. It is more difficult to change people's attitude toward bread, which is not easy to come by, but is frequently too easily dispensed with.

COTTON. Let us look at the textile branch, which is equally significant for mass consumption. The USSR produces about 20 percent of the world volume of cotton. We produce 8 billion square meters of cotton fabric from it, or approximately 28 square meters per person, including nursing children. The first question to arise is why is there a shortage of these fabrics. This reason is usually given: the fabrics are not used for their intended purpose, for mass consumption, but for production needs. This amounts to about 1.5 billion square meters. The USSR Gosstandart and a number of industrial ministries, particularly the USSR Ministry of Light Industry, several years ago came out with an initiative to conduct the operation "Replacement" in all branches in order to use artificial fabrics instead of cotton for industrial needs. Now, in the majority of cases, the standards do not allow industrial products to be packed in natural fabrics. And this has produced its first results. Unfortunately, the process is not taking place very actively.

Economizing in the textile branch has its ecological aspect as well. It takes 1.5-1.7 meters of fabric to make one shirt, or 1 kilogram of raw cotton. This is mainly Uzbek cotton. It takes 5 cubic meters of water to obtain 1 kilogram of this cotton. Forty percent of the water is taken from the rivers that flow through Uzbekistan into the Aral Sea and put onto the cotton plantations. As a result of the effect of this and other natural factors, the level of the sea has dropped and the area of its surface has decreased.

\*SOVETSKAYA ROSSIYA, 1 June 1983

Uneconomical management causes a long chain of all kinds of unfavorable consequences. And it is difficult to find the initial cause of the losses which we are experiencing today. As is obvious from the example of cotton production, large expenditures are required to eliminate them.

Added to the socio-economic and ecological losses are more serious ones -- moral. If a person loses his sense of responsibility for what is around him at the given moment and for what happens in the future (inefficiency is not far-sighted!), this is the most difficult of all to rectify.

#### Elements of Economical Management

Here is how the summons "To Work Economically" was interpreted by economists of the GDR: to measure more precisely, to calculate better, and to reduce costs. At first glance everything seems clear here. Yet this is far from the case.

The main indicator of a country's economic might is the national wealth. Legitimately proud of its amount measured in rubles, we nonetheless stipulate that it is evaluated without taking into account the value of the minerals, water, land and timber. The amount of the most important constituent parts of the national wealth is given in physical indicators (tons, cubic meters). Consequently, we need an acceptable methodology and methods for evaluating natural resources. We do not have one yet, which, of course, affects the feasibility of the idea about economical management.

The next step is precise measurement of the product which has already been produced and delivered to the consumer. Without this there is no point of departure for the next step -- expenditure of the products. With our scale of management such a measurement is a serious problem with great consequences. For example, at many enterprises mass cargoes are received without checking the weight, with simply a visual check. But the partners are not always conscientious. Thus, translated into the annual production volume, the underloading of cargo amounts to a failure to deliver to the consumers about 4 million tons of cement (there are also higher estimates). The cement that is not received must be written off as an overexpenditure. And there are many examples like these.

Qualitative accounting constitutes a large reserve for savings. There are estimates that, because of a lack of precise accounting for the delivery of fuel in the country, millions of tons of conventional fuel are annually burned for nothing in the country.

Another aspect is the expenditure of products itself. Here we rely directly on the condition of normative management. Many expenditure norms are purely conventional.

GASOLINE. For example, various organizations in rural areas (Sel'khoztekhnika, Sel'khozstroy, sovkhozes) are oriented for norms of expenditure of gasoline of from 106 to 210 grams per 1 ton-kilometer. These organizations have the same makes of vehicles, the same roads, and frequently the same service stations. How does one explain the difference in expenditures? By the ability of some departments to prove that the

expenditure norms are low. And in other departments they sometimes do without norms completely.

ROLLED METAL. In 1982 many enterprises of the Ministry of the Automotive Industry and the Ministry of Tractor and Agricultural Machine Building did not have norms for the expenditure of rolled ferrous metals for the manufacture of products, that is, actually any expenditure was sanctioned, at the discretion of the designers and technologists. If such a practice were to be extended everywhere, would the 100 million tons of rolled metal that are produced in the country annually be enough? Not a single other country in the world produces this much rolled metal.

ELECTRIC ENERGY. On the other hand, because of the lack of appropriate instruments and means of control, the consumers frequently are forced to increase their demands for resources, for example, for electric energy. Thus in ferrous metallurgy, where about 9 percent of the unionwide supply of electric energy is used, the demand is constantly being increased by 10-20 percent.

A large role is also played by increasing the scientific substantiation of long-range plans and developments and departure from traditional methods of calculation. In one of the plants of this same ferrous metallurgy branch, for example, the plan for 1990 earmarked electric power consumption in the amount of 1.5 billion kilowatt-hours. But on the basis of the scientific approach calculated for the Prognoz system, it became clear that one-third of this amount will be consumed! For the Oskol'skiy Electric Metallurgy Combine, the load was determined at 1,700 megawatts by traditional calculations, but Prognoz produced a different figure -- only 600.\*

The last place among the elements of economical management is held by increased responsibility for the expenditure of raw and processed materials in each working position. Let us recall that during the period of restoration of the national economy after the war, and in subsequent decades, the country produced several times less metal than today, but each kilogram of it was accounted for and used strictly for its intended purpose. Parties guilty of inefficiency, extravagance and defective work were punished. Nobody has changed these norms of responsibility. It is all a matter of observing them.

Very frequently inefficiency is there for everyone to see. Control agencies, one might say, "stumble" across supplies of excess materials and equipment that is abandoned and poorly stored. As a result of their intervention, measures are usually taken immediately, and things are set straight. And so sometimes new capital investment are not required. Sometimes there is not enough arithmetical, but efficient and strict accounting for the storage and expenditure of resources. There is not enough adherence to the long-known rules which require that we save on each kilogram of metal, each kilowatt-hour of electric energy, each liter of gasoline, and each minute of working time.

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\*SOTSIALISTICHESKAYA INDUSTRIYA 10 April 1983.

And the enterprises do not exert enough effort to be profitable, to operate smoothly and to produce high-quality products. The process should be broader. It is necessary to have a new art of management, a new style of thinking and behavior, and higher moral requirements. "Now economy and a thrifty attitude toward the national wealth is the issue of the feasibility of our plans," said Yu. V. Andropov at the November (1982) Plenum of the CPSU Central Committee. "Now the question of economizing on material resources should be regarded in a new way, and not so that 'you have saved -- that is good, you have not saved -- that is all right too.'"

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## GOSSNAB EXPOSITION SHOWS HOW TO MAKE USE OF WASTE PRODUCTS

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 57-59

[Article by Yakov Makhlin (Kiev): "Wastes Today, Raw Materials Tomorrow"]

[Text] "The Ukrainian SSR Gossnab is an example worthy of emulation. Pavel Ivanovich Mostovoy (Chairman of Ukrainian SSR Gossnab) has managed to create and consolidate a collective of innovation enthusiasts. Young people, dear comrades! We shall definitely take advantage of your experience." -- L. D. Kubovitskiy, chairman of the Latvian SSR Gossnab.

The same kinds of entries were made in the book of comments by representatives from Kazakhstan and Moldavia, Moscow and Tyumen. All of them had visited the exhibition in Kiev which was organized by the Ukrainian SSR Gossnab.

Displays in the exhibition, which was located in an immense shop area of more than 3,000 square meters in the Kiev Cardboard Combine (incidentally, a creation of the Ukrainian SSR Gossnab) showed: a) how to look for and find reserves, and b) how not to lose what we have.

The organizers of the exhibition gave their due to all who can and cannot do this. How can the experience of the Kislorodmash Scientific Production Association not be an example for imitation? Without increasing metal consumption by a single kilogram, under the last five-year plan the association increased the production of products 1.5 fold as compared to the preceding one. One can go up and touch a pump which weighs half as much as its predecessor, and is just as good or even surpasses it in terms of capacity and other parameters.

Many specialists were interested in a device intended for applying hard coatings. With it, the strength of a metal cutting instruments increases 3-5 fold, which reduces the need for it by an equal amount. The instrument was manufactured at enterprises of the Ukrainian SSR Gossnab.

Nearby are "bars" of nonferrous and ferrous metals and components and parts of new machines. From the accompanying inscriptions it is clear that this is an altogether contradictory phenomenon: they have been extracted from scrap

metal at the plant and city dumps. Most frequently the body is damaged, but the components and parts could well have served as spare parts. This, however, has not been the case. A large motor-generator was sent directly from the plant conveyor to the dump. True, we should clarify that after the conveyor it went to the equipment dump, where it was removed by the loaders.

Let us take paint and varnish materials, of which there is an increasingly critical shortage. When seeing the cans and barrels of these materials one automatically thinks: would it not be better to devote our efforts to creating convenient and durable packaging than to increase the production of paints and varnishes. And it would be possible to restore a considerable part of the putty, spackle and paints that have dried out. This is already being done at the republic Gossnab bases.

Each year footwear factories throw away thousands of tons of leather scraps, and they could be used to make watch bands, all kinds of sundries, and decorations. We are not even speaking about the boots shops which are directly on their way. This would probably be more realistic than to hope for high-quality raw material. And in this same Donbass they could use wastes from coal enriching factories as raw material for brick plants. As a result, the expenditure of fuel in producing brick would decrease to two-thirds the previous amount, without harm to the quality of the products.

One wishes to argue with the organizers of the exhibition about some things. Especially when speaking about the millions of tons of wastes that are lying around in the dumps of ore enriching enterprises. Is this raw material or empty rock? Scientific and planning organizations must answer this question.

Of course we have become accustomed to the fact that each department looks after its own needs and its own enterprises. But take a look at the mineral slabs. Ukrainian enterprises send more than 150,000 tons of this slab to all regions of the country, even to the Far East. It would not be so difficult to organize their production near to the places of consumption. In addition to the fact that these slabs do not hold up well during transportation, the handling capacity of the railcars is utilized by barely one-third when shipping them.

In turn, the republic ships in many products which could quite easily be produced locally. Thus about 7,000 cars deliver thin sheet steel and other metals from Cherepovets and Orsk, although these products could be produced at Ukrainian metallurgical enterprises.

A map of the republic, illuminated by lights, clearly shows how all eight territorial administrations of the Ukrainian Gossnab are joined into one by an automated control system. It helped to release thousands of accountants. Nonetheless the neighboring stands convince us that the possibilities of computer equipment, from the standpoint of information about what is located where, are far from exhausted.

Each of the territorial administrations of the republic Gossnab publishes a bulletin which contains lists of raw and processed materials which the clients have not found. And the Kiev administration even organized a permanent

travelling exhibit of wastes and ownerless raw and processed materials. Each item is assigned a special card. For instance, "brass pipe (GOST indicated) with a diameter of 7 millimeters. No use for 5,500 running meters a year. Release price not established." A typical ending -- why does one need a price for an item that has been discarded?! But soon a price will appear for such items.

Representatives of the Ukrainian SSR Ministry of Local Industry have expressed a desire to acquire many discarded materials. But it seems that it would be much simpler if the information about these wastes and raw and processed materials which nobody needs any more were entered into electronic computers. Then such information could be acquired much more easily.

There are many losses in industry because of unsatisfactory packaging. The example of paint and varnish materials was already presented above. Machine building enterprises of the republic use 11 million cubic meters of timber for packaging products. One-third of it could be eliminated if they used the collapsible folding cardboard containers and the reusable metal containers which were extensively displayed at the exhibition.

This also includes the "bottle" problem. Fruit and berry "fizzes" have appeared on the dining tables because of the efforts of Gossnab organizations. For until recently they did not accept champagne bottles at the bottle return points. The process of making champagne requires new containers. But previously used containers are quite suitable for "fizzes." Now the republic has even established a plan for receiving these bottles -- no less than 6 million of them a year.

The republic's industry is also obligated to Gossnab workers for the fact that every third ton of steel, every fourth tone of paper and cardboard, and every fifth ton of nonferrous metals and sulfuric acid are produced from secondary materials. And there are possibilities of increasing these indicators.

On the stands of the exhibition one could find restored automobile tires and batteries, low-voltage equipment, thousands of household gadgets, rugs, linoleum, sheet wadding, and comfortable and attractive special clothing.

The exhibition made it possible to become familiar in person with the experience of those who are trying to return secondary wealth to economic circulation. It has served as a good school of management.

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## YAMBURG GAS FIELD DEVELOPMENT NORTH OF ARCTIC CIRCLE DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 60-67

[Article by V. A. Fatikhov, head engineer of the Nadymgazprom production association, and Ye. L. Posadskiy, head engineer of the directorate for building up the Yamburg deposit: "Yamburg: The First Steps"]

[Text] The party devotes special attention to the development of the country's fuel and energy complex. In the energy program an increasingly large place is being assigned to the gas industry; a kind of "gasification" of the fuel and energy complex is taking place. The extraction of natural gas did not begin until 1944 when the first gas industry organization went into operation near the village of Yelshanka near Saratov. According to the 11th Five-Year Plan, in 1985 natural gas should surpass petroleum for the first time in terms of the volume of extraction translated into conventional fuel. Gas will provide for a 75-percent increase in the fuel and energy resources that are obtained.

The main work for extracting gas in the USSR is shifting to the Polar and Transpolar areas. Under the current five-year plan all of the unionwide increase in blue fuel is being provided by the Urengoy gas condensate deposit, which is located in the Far North. The magazine familiarized its readers with the production and social problems of the Novo-Urengoy industrial unit in issue No 5 for 1983.

Under the 12th and 13th Five-Year Plans it will be necessary to form a new center for extracting natural gas in the Arctic zone: the Yamburg gas condensate deposit is being put into operation. This is the one which will play the leading role in increasing the extraction of gas in the last decade of our century.

In terms of its complexity, Yamburg can be compared with such a well-known plan as the construction of the Baykal-Amur Mainline. The prospects are impressive: this is not only a construction project of this century, but also one of the main fuel and energy bases of the next century.

The economic assimilation of the gas deposits is taking place under unusual natural and climatic conditions, and it frequently involves solving principally new production, technical-technological and social problems.

Taking into account Yamburg's exceptional significance in the country's economic potential, the magazine is taking on the responsibility of providing regular information for the readers concerning the course of assimilation of the region, the problems of Yamburg, and the search for ways of solving them. In this issue we are giving the floor to pioneers in its assimilation.

The high rates of increase in the extraction, preparation and transportation of gas will be maintained in the Western Siberian petroleum and gas region until 1995 as a result of the assimilation of the northern deposits in Tyumen Oblast. Under the 12th and 13th Five-Year Plans the Yamburg gas condensate deposit will be the main one in terms of the increase in extraction of "blue fuel." Within a couple of years the first two industrial organizations will be functioning in Yamburg. A detachment of trail blazers -- machine operators, drivers and energy technicians of the Nadymgazprom association -- has already been working for several months here, 200 kilometers north of the Arctic Circle. The pioneer settlement is growing and being built up. A good deal has been done since the first landing party of the tractor and sled train arrived here in January 1982. They have shipped in 38 trailer houses, heated for winter conditions, and four cars have been put together under one roof to be used as a dining room. Joined together by a common hall which seats 50, they form a single complex. Troposphere communications are working regularly, with direct connections to Nadym along multichannel invisible lines. A television station is in operation with an Ekran-KR receiving and transmitting device. The station produces electric energy with two AS-804 aggregates. In April 1982 drilling equipment for the Polar deep-drilling expedition was brought in over the winter roads. A large warehouse for fuel and lubricants was assembled promptly and filled with fuel.

In general the tractor and sled train to Yamburg has been assigned the goal of digging a passage channel -- between the shallow mouth of the Nyudya-Nongotoyepoko River and the bar-filled section of the shoreline of Ob Bay. And the channel had already been constructed in May. After the man-made channel had been built, a water area was formed for the pioneer port of Yamburg so that it could receive sea transportation barges. In August 1982 on the smooth surface of Ob Bay at Yamburg, the steamships Krasnoural'sk and Komiles began their trip, delivering imported structures and equipment for the housing complex for 400 residents. True, the surface of Ob Bay is rarely smooth. Because of the gently sloping shallow shoreline in the Yamburg region, it was difficult to tranship the structures and equipment for the residential villages from the sea ships to river boats. On the one hand there were stormy winds, and on the other, there were no special lifting mechanisms.

The unloading on the bank of the mouth of the Nyudya-Nongotoyepoko River was also done with great difficulty: the caprices of the weather were a constant impediment. But they unloaded promptly, completely and in good condition the valuable equipment and the housing complex with its houses, school, kindergarten, bakery, bath house, club, sports facility, polyclinic, dining room, administrative building, store, refrigeration facility, vegetable

storehouse, purification installations, boiler and other auxiliary structures. During 1982 more than 20 barges were unloaded at Yamburg.

But the main task -- starting up two installations for comprehensive preparation of gas -- will have to be carried out in 1984-1985. The severe arctic conditions of Yamburg cannot be compared with Medvezhye or with Urengoy. On the whole the terrain is flat, but in places it is hilly, broken up by the network of rivers and ravines, and marshy. The scanty patches of moss, lichens and bushes do not fully cover the ground. The region is filled with lakes of the most varied sizes and shapes. They occupy an average of 25 percent, and in some places 30-40 percent of the overall area. These lakes freeze through to the bottom. Near the installations for preparing gas are no ground sources of water which can satisfy technical and household needs. It is not yet clear whether it is possible to obtain water from wells which are drilled to deeper levels.

Climatology and geophysics of the Tazov Peninsula have the following figures for the Yamburg region: the average daily temperature in the warmest month (July) is plus 13.4 degrees centigrade; the absolute minimum temperature is minus 60 degrees centigrade; the absolute maximum temperature is plus 32 degrees centigrade; the average temperature during the coldest 5-day period is minus 45 degrees centigrade; and the temperature on the coldest days is minus 50 degrees centigrade. The short light year, the long winter with its severe frosts, the winds which frequently turn into storms and blizzards which gather exceptional force, the short summer, the high humidity of the air and the frequent fog -- such are the main features of the severe climate that makes the assimilation of the region more difficult.

The plan for transportation service for the Yamburg deposit envisions the construction of an airport and a river port which will receive some of the cargo. Improvement of the roads would make it possible to reduce capital investments on construction and installation work. A comparison of the three variants of cargo shipment, which differ in terms of the proportions of the kinds of transportation (rail, water and automotive) has given preference to rail-water for Yamburg.

Obviously, until 1985 the only mainline connecting Yamburg with the mainland will be the river mainline. This is Ob Bay with its short navigation period. According to preliminary calculations, for the initial minimum alone it will be necessary to ship millions of tons of cargo to Yamburg. But until the completion of the construction of the port, the pioneers can unload only one-fifth of this amount from the docks of the Nyudya-Mongotoyepoko River.

This circumstance makes it necessary, while constructing the facilities for building up the Yamburg deposit, to reduce the volumes of construction and installation work at the construction sites; the number of bases of construction organizations in the regions of the deposit has been reduced to a minimum; and the rates of construction of ports, railroads and the airport have been made less dependent on the arrival of equipment and construction materials.

In November 1982 and February 1983 the Tyumengazprom all-union production association, the Nadymgazprom production association, the YuzhNIIGiprogaz general planning institute and the SibNIPIGazstroy institute held a conference on developing installations in block variants -- they are manufactured by the Sibkomplektmontazh association. A decision was made to change the main volume of work over to plant conditions, using the Tyumen base of the construction industry. As a result, practically prepared sets of equipment will arrive at the construction site, including the construction parts, technological and sanitation equipment, and underground mains. All that will be left will be to install them. This reorganization will undoubtedly accelerate the construction and improve its quality. Large block-pontoons weighing up to 300 tons made under plant conditions will be conveniently delivered to the Yamburg deposit along the Ob, with subsequent transfer to dry land by ships on air cushions or by portage.

Sibkomplektmontazh has already begun to manufacture superblocks on floating foundations in the building slips of the Tura River. In 1983 they intend to gather and deliver to Yamburg 10 block-pontoons with boilers for the residential village and industrial base, installations for comprehensive preparation of gas, and the technological building for preparing gas. The block-pontoon variant of constructing facilities is also economically expedient.

With this progressive approach to constructing the above-ground parts of the buildings and structures, the arrears in constructing foundations, which is done by the traditional method, are especially noticeable. The time has come to search for advanced methods for this too. Obviously, the principle for constructing foundations should correspond to the principle for constructing above-ground structures. The only ones that correspond to this are the shallow ventilated foundations which preclude or reduce to a minimum the labor-intensive work with frozen ground. A solution has been found: the foundations developed by the SibNIPIGazstroy with the participation of the NIIOSP of the USSR Gosstroy, Nadymgazprom and the directorate for developing the Yamburg deposit, which envision ventilated subflooring and strips which make it possible to leave the ground frozen. They have already started to construct these on experimental facilities in Yamburg. Preliminary calculations show that the labor-intensiveness of the installation of such foundations at the construction site decreases to one-fifth - one-sixth the usual level, and the cost of each square meter decreases by 33 rubles.

It is necessary to search for new scientific-technical and technological solutions which will make it possible to accelerate the beginning of the operation of the Yamburg deposit. To do this scientists and specialists of scientific research and planning institutes of the USSR Ministry of the Gas Industry must supervise the plans, as was done during the assimilation of Medvezhye: this cooperation enabled the Nadymgazprom association to bring the deposit up to the planned capacity in 5 years.

It is precisely here, at the juncture between science and practice, that there are many unsolved problems. From the general planning institute, YuzhNIIGiprogaz, for example, we expect planning and design solutions in the area of environmental protection. This pertains to institutes of the Ministry

of the Gas Industry as well. We do not know how to prevent or reduce the swelling of the ground under the pipelines which are laid in permanently frozen soil. We need figures about the fluctuations of the temperature and the sensitivity of the soil to warming. Are they investigating the idea of using frozen ground as a source of potential energy? For there is reason to assume that it can be used in engineering designs, and also as a construction material when constructing certain underground facilities (refrigeration capacities, reservoirs, and so forth). So far we do not have a program for studying the habitats of birds, deer, polar foxes, rabbits and also fish which are found in the rivers, streams and lakes near the planned assembly points and gas lines. Even now we must have a clear idea of the influence of the industrial development of the Yamburg region on the environment, and above all on wild nature, the air and water basins, the tundra with its reindeer pastures, and many other ecological factors.

We are expecting of YuzhNII Giprogaz the following useful research. First, we need a careful geological study of the Yamburg region, which will help to determine the deposits of construction materials (sand, gravel) and the possibility of using them for the development of a local construction industry. Second, it is necessary to investigate as quickly as possible the hydrological conditions of the lakes, and then it will be possible to work underwater mines with dredges -- they are necessary for pouring gravel for construction sites and highways (one must say that hydromechanization is the most progressive and economical method of doing ground work. It makes it possible to combine working of the soil, transporting it and packing it into the body of the structure). Third, we need a program for restoring the moss and plant cover of the tundra on sections where underground mains have been laid, and also experiments on planting bushes and deciduous and coniferous trees.

The ground transportation which we receive -- cross country vehicles, trucks and tractors -- are not reliable enough under the conditions of the North, the more so in the Transpolar region: they break down frequently and wear out quickly, they are not sufficiently equipped with life-support devices in case they are forced to stop enroute. The coefficient of delivery of the fleet to the line in the Nadymgazprom automotive transportation enterprise is 0.5-0.7.

The country's industry has long been faced with the task of creating means of transportation for use in the North which can operate on local fuel -- gas condensate and petroleum and natural gas. This will make it possible to considerably reduce the fleet of vehicles and the number of service personnel, to extend the service life of the vehicles 2.5-3-fold, to reduce capital investments in the construction of bases, and to reduce the supply norm from 300 days to 100.

Additionally, we need drilling equipment for use in the North -- drilling instruments, turbodrills, pumps and so forth. It should have high operational reliability with minimal expenditures of live labor.

But still, in first place are socio-economic problems, and above all reducing the influence of arctic conditions on man's health, increasing his ability to work, and improving the psychological condition of workers employed in the

construction and working of deposits in the Polar North. From the very beginning of work on the plan for the assimilation of Yamburg, all interested organizations were bothered by the problem: should we build a city at Yamburg or bring people there from Nadym and other cities?

Today the Nadymgazprom production association is having to pay dearly for a mistake made in the construction of the workers' village of Pangoda. The plan envisioned it as a village for temporary workers, but today 8,000 people live there and it is the main workers' settlement of the entire Medvezhye deposit. Our task is not to repeat this mistake.

The temporary expedition method, which involves prolonged separation from the family and physical and psychological loads, is of a compulsory nature. Medicine and biology, which are investigating adaptive mechanisms, man's adaptability to the natural and climatic conditions where he lives, do not have (at least not that we know of) adequate criteria which make it possible to evaluate the conditions of the kind of temporary labor and predict its consequences. Here science must give us important information, and the sooner the better.

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## INTERDEPARTMENTAL SQUABBLING HURTS REGIONAL DEVELOPMENT

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 68-83

[Article by M. K. Shishkov, chief of the financial division of the rayispolkom, Talmenka, Altay Kray: "Departmental Separation in the Region: How To Overcome It?"]

[Text] The modern stage of the development of the economy has brought forth one of the most important problems, the problem of combining branch and territorial planning and administration. The contours of its solution have been determined in a number of decrees of the party and government, and above all in the decree of the CPSU Central Committee, the Presidium of the USSR Supreme Soviet and the USSR Council of Ministers of 19 March 1981, "On Further Increasing the Role of the Soviets of People's Deputies in Economic Construction" -- the basic program document for questions of economic development in the krays, oblasts and rayons. The article by M. K. Shishkov uses materials from a specific rayon to consider ways of carrying out the tasks that have been set.

Let us remind the readers of the last large articles in EKO about the problem of combining branch and territorial planning and administration. They include the selection of articles "The City and the Board of Directors" (EKO, 1981, No 10), the article by R. I. Shniper, "Planning in the Region: Contours of the Future" (1981, No 12) and two series of responses to this article (1982, No 4 and No 7).

Departmental separation, departmental barriers, the departmental approach -- how frequently we encounter these words in articles on economic subjects! But perhaps not all of our problems have to do with departments. But it is clear that the dispersion of forces and funds to which they give rise, the friction at the junctures, in the interactions of branches, enterprises and organizations, and "homeless" functions -- such is the price we pay for the nature of departments.

## Capital Construction

What is it within the framework of a single administrative region? The main branch of the Tal'menskiy Rayon, like the majority of oblast (kрай) administrative regions, is agriculture. Hence also the construction organizations -- mobile mechanized columns (PMK). We have two of them: the Tal'menskaya PMK-203 is for regional work and is to carry out construction on four sovkhozes and in the rayon center, and PMK-1148 was created in 1974 especially for the construction of the Ozerskiy hog complex which accommodates 108,000 head. From the very beginning it was clear that the Ozerskaya PMK was not able to cope with its tasks, and therefore the Tal'menskaya PMK was to render assistance. And for almost two five-year plans the two organizations have hindered one another in constructing this important object.

One could frequently see workers sitting around at the construction site.

"Why are you not working?"

"There is no brick."

"But there is brick right there!"

"That is not ours. It belongs to the other PMK ..."

The housing for the builders of the Ozerskaya PMK was constructed by workers of the Tal'menskaya PMK, and the boiler that is part of the complex was constructed by workers of the Ozerskaya PMK. The deadlines for their startup did not coincide, and it was necessary to construct a temporary boiler. Ordinary departmental problems? But the two PMK's have the same higher organization -- the Barnaulsel'stroy Trust.

In the Altaysel'stroy system intradepartmental separation is manifested in the separation of general contracting and subcontracting organizations.

The fleet of cargo trucks and the mechanization administration, where all the heavy construction equipment is concentrated, are not only not under the jurisdiction of the chief of the PMK, but they do not even answer to the manager of the Barnaulsel'stroy Trust. They have their own interests and their own plan, for whose fulfillment they receive a bonus even though the facilities are not introduced on time. The dependency of the general contractor on his partners is manifested in exaggerated figures for ton-kilometers and hours of operation of heavy equipment. As a result, the overexpenditure under these items in the mechanized columns amounts to hundreds of thousands of rubles.

In addition to the sovkhozes, there are nine kolkhozes in the rayon. Thus, naturally, they have their own construction organization -- Mezhkolkhozstroy. But why "naturally"? For there is no basic difference between, say, two-apartment buildings on the kolkhozes and sovkhozes. Why do they need their own organization? They answer that they have different sources of financing, that Mezhkolkhozstroy exists on deductions of funds from the kolkhozes. But

can these deductions not be deposited in the accounts of those subdivisions of Altaysel'stroy?

Having their own contracting organizations, both the kolkhozes and the sovkhozes carry out construction through their own means. As a result there are two agencies for management of construction which exist in parallel: the interkolkhoz capital construction department and the head engineer-building of the agricultural administration of the rayispolkom. Each farm has a small section for the contractor, made up of 2-3 facilities headed by a master or a supervisor. Brigades from the rayon center certainly do not work here every day, since the construction workers have 2-3 people for one object. The brigade for the direct labor method, as a rule, is even smaller. Sometimes it is made up of people who have already worked all day, and it is headed by a supervisor of the kolkhoz or sovkhoz. It turns out to be not only "their own," but "doubly their own." True, one can also give good examples in which the direct labor method is used to do a lot of high-quality construction -- for instance, on the Magistral'nyy Grain Sovkhoz or the 30 let Pobedy Sovkhoz.

Would it not be better, under the conditions of the just created rayon agro-industrial associations (RAPO), to form a unified construction organization which would combine the three existing contracting organizations, direct labor brigades that are parts of the RAPO, and the service of the clients? The chief of this organization could be the deputy chairman of the RAPO for construction. The contractor and the client would be the same. The section chief of the construction organization would be the same kolkhoz or sovkhoz supervisor and there would be no difference between "their own" (direct labor) and "others'" (contract) objects in rural areas. And this would be the "legitimate" combined construction which is being discussed so much.

The largest industrial enterprise of the rayon is the plant for sets of tractor equipment. The renovation and capital repair of the buildings here are being done by their own contractor -- the supervisory section of the Yuzhuralremstroymontazh trust of the Ministry of Tractor and Agricultural Machine Building. Until recently, the two plants of the Ministry of Rural Construction also had their own contractor -- the PMK brigade of Altayelektorstroy. The consumers' cooperative also has its own contractor -- it is the construction section of Altaykoopstroy.

Well, who is to construct facilities for general village purposes? For example, the rayon center is extremely in need of a sewage system, an overpass and a foot path across the railroad, and the problem of housing and kindergartens is critical.

Again and again one arrives at the idea: they need one contractor who would be able to construct all of these objects -- in sequence, naturally, -- and also do the work for construction and renovation of industrial enterprises which is now being done by extremely small departmental contracting subdivisions. The construction and installation administration of one of the trusts of Glavaltaystroy of the USSR Ministry of Construction could be such an organization.

## Industry

The largest branch of industry in the rayon is timber and wood processing. Twenty-three organizations engage in milling, including 12 kolkhozes and sovkhozes. They have 35 milling shops, the majority of which are primitive, with a low level of mechanization, and the people work out in the open air. These saw frames are used on one shift, and even then there is not always enough wood. Frequent idle periods reduce labor discipline and increase labor turnover.

And the large mechanized sawmill shop of the plant for metal structure of the RSFSR Ministry of Rural Construction is capable, by working on two shifts, of producing no less than 40,000 cubic meters of timber material a year. It works only on one shift and during 1982 it produced only 12,000 cubic meters. The volume of lumber products decreases each year. The reason is the chronic shortage of milling timber, which comes to us from Krasnoyarsk Kray. And timber and wood products are shipped from our rayon to many other places, even Central Asia.

The sawmill shop is capable of replacing all the small sawmill frames in the rayon. Such a reorganization would release several dozen people. Even such a large enterprise as the Talmenka wood processing combine of the kray forestry administration, which produces more than 60,000 cubic meters of lumber a year, is not capable of manufacturing chip board: it does not have enough wastes. And at the same time the milling wastes in the majority of sawmill shops of the rayon are used for fuel or litter for animals and poultry at best. Much low-grade timber and wastes remain in the timber procurement areas as well.

## The Automobile and the Road

One time at an operations conference with the chairman of the rayispolkom I had occasion to witness a dispute between the director of the automotive transportation enterprise and the chief of the road repair and construction section. The former gave as one of the reasons why the buses did not go out on their runs that they did not have prompt information from road workers about snow drifts. Transportation workers must receive it at 6 a.m. -- before the buses go out on the line. The latter thought that to provide information about 200 kilometers of road in the rayon by 6 a.m. was neither practical nor theoretically possible, and that it is possible to find out about snow drifts on the road only from the bus drivers themselves.

The motor vehicle and the road are inseparable from one another. It is natural to think that they should have one master. But this is not the case.

Almost 1,500 trucks, passenger cars and buses are owned by about 100 organizations in the rayon. Of these, three are on independent books. The largest automotive transportation organizations in the rayon are the Transsel'khoztekhnika ATP and the ATP for general use (of the Ministry of Automotive Transportation). It would be wrong to say that the former handles cargo shipments only for agriculture and the latter, all the rest.

During the time of harvesting work the managers of both ATP's attend daily staff meetings on the harvest and receive orders for assigning vehicles to the farms. Local soviets (rayispolkoms) and road workers have limits for both enterprises. Although the rayon consumers' union has an automotive base, it cannot handle all of its shipments (the fleet of vehicles has not been augmented for a long time) and therefore the rayon consumers' union also has limits for shipping cargo and, moreover, it turns for help from kolkhoz and sovkhoz transportation.

What is the difference in the specialization of the automotive enterprises? Only the departmental jurisdiction. So would it not be better, instead of three organizations, to have only one, whose three automotive columns would actually be specialized in terms of kinds of machines, or one of them would be a powerful repair base?

The dispersion of automotive transportation gives examples of other kinds of shortcomings which are more unacceptable than purely economic ones. At the meeting of the rayon people's control committee there was a discussion of false reports in the Transsel'khoztekhnika ATP. A frank answer was given to the question of why they were allowed: it is possible to impose order, but the drivers will lose earnings and will go to other organizations, since false reports exist in other places as well.

Workers in the financial division are constantly discovering violations of the rules for using automotive transportation: malfunctioning speedometers, incorrectly filled-in trip sheets, a lack of incentives for economizing and penalties for overexpenditure of fuel, and so forth. As a rule, the fewer vehicles there are in the enterprise, the more violations there are. And it is impossible to avoid turnover of personnel when automotive transportation is dispersed, even with exemplary order. When the Sel'khoztekhnika ATP was formed and new vehicles began to arrive, drivers began to come there from the general purpose automotive enterprise; when they created the road construction PMK, the drivers went there from Transsel'khoztekhnika; and they went to Sel'khozhimiya from this same road construction PMK.

Although the fleet of machines is constantly being augmented with new ones, the shortage of automotive transportation, and not only during the harvest period, is still a critical problem. But how are the motor vehicles utilized? The rayon has almost a thousand trucks and not a one of them operates on two shifts, even during harvest time, in spite of the annual decrees regarding this issue. The depersonalization which is supposed to occur when motor vehicles are operated on two shifts, for some reason, is not so terrible in air and rail transportation. The machine tools are operated on two shifts in machine building and other branches of industry.

The real reason for the reluctance to use the automotive fleet on two shifts is departmental separation. By concentrating the majority of vehicles in one organization it would be possible, with the help of beneficial rates and other measures, to motivate the clients to utilize vehicles that operate on two shifts.

The situation is no better with the roads. The rayon has two main road organizations: the rayon road repair and construction section (DRSU) of the RSFSR Ministry of Highways and the mobile mechanized column of Roskolkhozstroyob'yedineniye -- Tal' menskaya DPMK-2. The former is the client and the latter is a contractor in road construction. The former is an old organization, and the latter is not yet 10 years old.

After the formation of DPMK-2, which serves three rayons of the kray, they began construction of asphalt-concrete highways, new technical equipment began to appear, and a construction base was started. But the negative consequences of departmental jurisdiction were also immediately evident: the development of the base of the road workers, Altayavtodor, was slowed down, and personnel began to move from one organization to another.

Road workers of Altayavtodor receive on their books asphalt highways constructed by interkolkhoz road builders. Asphalt is needed to repair these roads. The asphalt and concrete plant of DPMK-2 is not operating at full capacity, but this is an "alien" plant, and DRSU is acquiring equipment for its own ...

The roads themselves are also an object of departmental separation. Some of them -- republic, oblast and rayon -- are assigned to organizations of the republic Ministry of Highways. Intrafarm roads are assigned to the kolkhozes, sovkhozes and timber industry enterprises. Roads within cities and workers' settlements are assigned to the municipal service enterprises of the local soviets. But is it only the kolkhoz or sovkhoz that needs the intrafarm roads -- from the central farmstead to the division? They are used by regularly scheduled general buses, the postal service, trade and consumer services, medicine and the movie network, the automotive club and the forestry workers, administrative agencies and private transportation. The roads are essentially for common use. So why should they be maintained only by the kolkhozes or sovkhozes?

In the press one sees proposals to create within the framework of the RAP0 a new organization for maintaining intrafarm roads. But would we not thus be reinforcing departmental separation? Would it not be more logical to concentrate all technical equipment and resources on the construction, repair and maintenance of roads, including intrafarm roads and roads of population points, in organizations of the Ministry of Highways? To combine both ministries -- the Ministry of Automotive Transportation and the Ministry of Highways -- into one union-republic ministry, and to change the structure of administration not quantitatively, but qualitatively?

Then there would no longer be that constant dispute between motor vehicle drivers and road workers. Automotive transportation workers, joined together into one rayon organization, would be concerned about the quality of the roads, and they would not be indifferent to the kinds of roads, where they are constructed first, and where to begin current maintenance. They would think about how best to develop the road network in the future. But now, because of departmental barriers, sometimes a road from the village to the mechanized

threshing floor is immediately paved with asphalt, and it is not paved to the village itself, but is covered with crushed rock ...

#### Housing and Municipal Services

There is a good deal of departmental separation in the rayon, but, perhaps, the municipal services beat all records. More than 80 rayon organizations have housing, and more than 50 of them are in the rayon center. Here there are 86 boilers which belong to 70 organizations. The rayon center does not have a unified system for gas and water supply or sewerage.

One cannot say that nobody is trying to overcome this separation. They have recognized the expediency and adopted the appropriate decisions locally to gradually transfer departmental housing to the jurisdiction of the municipal services. But so far this transfer is taking place slowly. Thus in Talmenka during 1981-1982 not a single apartment was transferred. Now in the rayon center municipal services have 16 percent of the housing and 9 percent of the boilers. Of the three operating systems of purification installations (these are simply filtration fields here), not a single one belongs to municipal services.

So far in the rayon center there is no service that acts as a unified client for the construction of housing and municipal facilities. One now sees a strange picture. All the housing and boilers that are constructed are supposed to be transferred to municipal services. But during construction the housing is distributed among three clients: the communal service administration of the krayispolkom, the rayispolkom and its housing and communal service administration.

The client, of course, should be the one who is to operate the facility. Then there will be control over the quality of construction at all stages. The production administration for housing and communal services of the rayispolkom should be this client.

The communal service administration of the rayispolkom exerts no influence at all on the services for the villages. This problem becomes more critical each year. More and more modern housing, schools, kindergartens and hospitals are being built. Running water and a heating network are being installed, so that electricity and gas are becoming more and more important to rural residents. And all this requires a responsible party to be in charge. His concerns should include all the cultural and domestic facilities of the village and the entire housing fund, not only state or kolkhoz, but also private.

The changeover to unified management of the rayon's communal services is necessary for this reason. Capital and current repair of schools, rural clubs, medical points and buildings of ispolkoms of rural soviets are carried out, as a rule, by hired brigades. They do not recognize state evaluations, and therefore they are always overspending the wage fund. And the quality of work in these brigades is frequently poor, which is also understandable: they want money.

There is another aspect of the problem. In Talmenka, as in any other rayon center, in addition to the communal services of the rayispolkom, there is a section for repair and construction of housing which is included in the system of consumer services. Both organizations procure timber themselves, and have saw frames, carpentry shops, trucks and tractors. They have mechanics, supply workers, and so forth. For example, in the section for repair and construction of housing, of the 40 workers 11 are engineering and technical personnel and employees. And if one is to speak about a single manager for service of the housing supply, regardless of whose it is -- state, kolkhoz or private -- is it worthwhile to maintain two organizations with similar functions at the same time?

#### How Do We Overcome the Departmental Problem?

Replacing the large number of small, underloaded, inefficient capacities with large productions is the first thing that comes to mind when one thinks about departmental barriers. But can one stop just at consolidation? How far can one go along this path? Large industries and organizations are not flexible enough, and their goals can sometimes stand in opposition to the needs of the consumers.

The creation of rayon agro-industrial associations is also associated with overcoming departmental separation. In the rayon there are now organizations of a number of branches that have been included in RAPO's and those that have not, but are still involved in serving agriculture. These include, for example, Mezhkolkhozleskhoz and timber industry enterprises, Mezhkolkhozdorstroy and the section of Altayavtodor, Transsel'khoztekhnika and the automotive transportation enterprise of the Ministry of Automotive Transportation. Let us say that when they are included in RAPO's one eliminates the contradictions and disagreements between the kolkhozes and sovkhozes and Mezhkolkhozleskhoz. But they still rely on help from timber industry enterprises and depend on them for many things. Should the timber industry enterprises be included in the RAPO? This would hardly be expedient.

The creation of agro-industrial associations can lead to the development of new kinds of interfarm organizations which operate in parallel with those already existing in the rayon. These could include, for example, rural communal service organizations and organizations for maintaining intrafarm roads, which were mentioned above. Therefore it is necessary to beware of creating a "state within a state," overcoming one kind of departmental separation by establishing another one. One must not confuse the concepts "rayon" and "rayon agro-industrial association."

The root of the problem lies in the combination of branch and territorial planning, in the need to establish a balance between branch and territorial systems of administration. Now, it seems, everyone agrees that branch or, rather, ministry planning and administration prevail over territorial. As branch specialization deepens, this prevalence will increasingly impede the adoption of effective decisions.

The deepening of branch specialization should be combined with the development and deepening of interbranch and territorial specialization. The production and social infrastructure (construction, transportation, communal services, public health, education and so forth) should develop correspondingly.

But the process of equalization of branch and territorial administration has not developed enough yet. And the main reasons for this, in our opinion, are the following.

First, the low level of contractual discipline and the shortcomings in material and technical supply. This factor has a dual influence on the development of departmental problems.

On the one hand, branch consumer organizations depend more on supplies and producers of work and services than the latter do on them. As a result, it turns out to be advantageous to have their own automotive enterprises, construction base, saw frame and so forth, even if they are extremely small ones.

On the other hand, the inefficiency of service organizations is frequently the result of shortcomings in the supply of materials, equipment, spare parts and fuel. If these organizations increase the plans for the volumes of goods and services, they are far from always provided with increased amounts of capital, and the selection of capital is not always provided in the complete quantity or the exact quality and assortment. Therefore the organizations of the infrastructure are in no hurry to expand their sphere of services. There is only one solution: to sharply increase the responsibility for the substantiation of the plans and for the observance of contractual discipline in all branches and in all spheres of the national economy.

The second reason for the slow change in the existing situation is the low level of territorial planning and administration. They say that it is sometimes more difficult to discover the problem than to solve it. Rayon statistics do not give many of the data necessary for analysis. For example, the volumes of production of lumber materials in all organizations of the rayon, the capacities of boilers or even the number of organizations that have a housing fund. But there is practically nobody in the rayon to subject even the existing data to a serious economic analysis. What can one or two workers of the rayon planning organization do? They should be promptly given a multitude of required forms and assignments related to the gathering of planning and accounting figures. The task is facilitated by the fact that many indicators are required for the rayon as a whole, without a breakdown for the various organizations. Then, for example, the plan for housing construction for the rayon can be determined for several leading organizations, without gathering data from a multitude of small and medium-sized ones -- this involves a lot of work and it does not essentially influence the overall result.

And ... it is as though there were no departmental problem. And there are none of those questions which inevitably arise when looking at a table of 50 organizations. But is it really necessary for each of them to construct their

own housing? What are the expenditures per square meter and what are the earnings per worker in each organization? And how many people can be released, and what would be the economic effect if the construction were concentrated in large organizations?

The kray planning organization is not capable of "digging through" such an immense amount of information from the cities and rayons. In spite of the measures that have been taken in recent years to increase the role of planning commissions, they still continue to be mainly agencies for planning business under the jurisdiction of the local soviets. So can a "departmental" agency fight against the problem of the existence of departments?...

It is time to follow more completely Lenin's instruction concerning "exemplary arrangement of a small 'whole,' but precisely a 'whole,' that is, not of one business, not of one branch of business, not of one enterprise, but the sum of all economic relations, the sum of all economic circulation, even if it is of a small area."\*

The organizational structure of the branches in the rayons and cities and the departmental separation that is related to it have taken form over decades, and it would be a serious mistake to try to overcome them in one fell swoop. It is necessary to have an in-depth analysis of the structure of the branches and organizations in the rayon and their economic ties, which takes into account local conditions and peculiarities, and a long-term program for economic and social development which is drawn up on this basis and is directed toward improvement of the branch structure, the development of interbusiness ties, and the surmounting of departmental separation. But this will require many years. It will take even longer for the process of centralization to change into a process of concentration of production. Here it is important to improve the methodology of long-term territorial plans and the organization of the development of preplanning research at all levels, including the lower administrative regions. It is necessary to coordinate in a unified program for the long-term development of the rayon plans for the development and distribution of branches, drafts of rayon plans, plans for building up population points, systems for settlement, and other documents of a long-term nature.

But even a good, scientifically substantiated plan is still not all that is needed. The rayon organizations have no economic incentive to cooperate not only with one another, but, the main thing, with territorial administrative agencies -- local soviets of people's deputies. This is another reason why the problem of departmental separation continues to exist.

Let us say that the rayon authorities prove the need to create an association for timber procurements and wood processing on the basis of organizations of four departments. To do this it is necessary to conduct a large amount of analytical work and to rouse all the economic services in the rayon. Then it

\*Lenin, V. I., "Poln. sobr. soch." [Collected Works], Vol 43, p 234.

is necessary to hold many conferences on questions of organizational restructuring and repeatedly bring up these issues before kray authorities. Nor can one manage without trips to Moscow.

As a result, an economic effect will be achieved. Part of it will go into the economic incentive funds of the enterprise, and another part will go into the republic budget. It will also receive deductions from savings resulting from reducing the administrative and management staff, which was one of the motivations for creating the association. But what will the rayon receive? Of course, a reduction of the number of organizations will lessen the work of numerous administrative teams in the rayon: there will be some reduction of the number of people invited to conferences and the time of the meetings, the number of banking operations and statistical reports, financial inspections and planning figures. And, in the final analysis, this too will produce an economic effect.

We are speaking about coordinating more closely the results of the financial work of enterprises of union and republic jurisdiction with the local budget. This problem is not a new one. It was reflected in the new edition of the law "On the Rayon Soviet of People's Deputies of the RSFSR" where it says in Article 5 that enterprises under republic jurisdiction transfer part of their payments from profit to the rayon budget. The income policy and the kinds and amounts of deductions should be established by special documents. More than 4 years have passed since this article was included in the law, but this policy has not yet been established. Only experimental testing is being conducted.\*

The effect of feedback will be manifested if the payment of the higher organizations become a source of capital investments for construction or renovation of objects of rayon significance: schools, kindergartens, hospitals, communal service facilities and so forth, that is, everything that affects the stability of personal and labor productivity in all organizations of the rayon. In this case, local soviets will be more motivated to utilize capital investments effectively. They are now allotted centrally and they do not depend on meeting the local budget. The ispolkom has a natural desire to receive more money and to begin the construction of more facilities simultaneously, the more so since there is no doubt about the need for them. A principle goes into effect: never refuse money. The main problem is to acquire a "line on the list" and then, one way or another, the money will be allotted before the introduction of the facility. This system increases the number of incomplete construction projects, gives rise to "long-term construction," and undermines the plan for startup.

Having their own sources for covering expenditures for capital investments will radically change the state of affairs in the construction of facilities for local soviets. There will no longer be a desire to introduce as many extra facilities as possible: for they will have to finance them themselves.

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\*See, for example, "The Poti Experiment," PRAVDA, 18 February 1983.

During the past several years enterprises under republic jurisdiction on the territory of Tal'menskiy Rayon have deducted into the budget (mainly in the form of payments for funds and free residual profit) an average of approximately 1 million rubles a year. During this same period, in keeping with the plan for capital construction of housing and cultural and domestic facilities, the local soviets received an average of 500,000 rubles a year.

Of course, it will be necessary to solve quite a few problems related to rayon autonomous financing -- the proposed system may be called this. For example, how to coordinate financial resources with the capacities of construction organizations? What to do if it is possible to allot a million rubles from the budget for construction, but the builders are capable of assimilating only a half million?

This system makes it necessary to have calculations for the main indicators of income and expenditures of the rayon budget for 5 years, which corresponds to the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979, "On Improving Planning and Stepping Up the Influence of the Economic Mechanism on Increasing the Effectiveness of Production and Improving the Quality of Work."

The financial plans and amounts of payments into the budget are now being changed for a number of organizations under republic jurisdiction. Possibly, these changes are not noticeable in the republic budget. But if some of the payments were to go into the rayon budget, difficulties could arise with the financing of planned measures, particularly the payment of wages to workers in the nonindustrial sphere. Again the solution here lies in increasing planning and financial discipline, the substantiation of plans and the responsibility for their implementation.

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## PROBLEMS IN BRIGADE FORM OF LABOR ORGANIZATION REVEALED

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[Article by B. P. Nezhdanov, candidate of economic sciences, Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk): "Practice and Theory of Collective Organization of Labor"]

[Text] Brigade forms of organization and payment for labor, which were approved in the decisions of the 26th CPSU Congress, are becoming increasingly widespread. According to calculations of the Scientific Research Institute of Labor, while in 1980 43 percent of the overall number of industrial workers worked in brigades, in 1981 53 percent did. As of 1 October 1982 in ferrous metallurgy the brigade form included 67 percent of the workers, and in heavy and power machine building -- 82 percent (in this branch the increase in labor productivity as a result of the brigade form amounted to 6 percent).

In the press there has been extensive discussion of Article 18 of the draft of the USSR law on labor collectives and increasing their role in the management of enterprises, institutions and organizations, "The Basic Authority of the Collective of the Production Brigade." This discussion has clearly shown the multitude of problems that have arisen in the practice of the utilization of the brigade form of organization and stimulation of labor, and ways of solving them. The selection of materials offered to the readers is devoted to certain of these problems.

Today attention cannot be diverted from the brigade form of organization and payment for labor. These questions are considered at conferences of party, soviet, management, trade union and Komsomol agencies, are included in programs for courses and seminars, and they are considered at conferences and symposiums, and on the pages of printed publications. A multitude of methodological guidelines, directions, instructions and forms are being

published for organizing brigades and supervising their functioning. The ministries and departments are sending out instructions to create brigades and are checking on their fulfillment. Statistical agencies have introduced a statewide accounting form for this question. A mass of scientific and practical projects on brigade organization are being carried out on a contractual basis. A large amount of practical experience has been accumulated. Much can be gleaned from the extensive discussion of the draft of the USSR law on labor collectives.

#### The Advantages of Collective Labor

Before discussing the problems of the brigade form of organization, it would be useful to clarify what it is, the more so since there are various interpretations of this concept. The most widespread terms in literature are "the brigade form of organization and stimulation of labor"; but at the same time they use such concepts as "brigade organization," the "brigade contract" and so forth. It seems to us that in all of these particular cases they are speaking about the same thing -- collective forms of organization and stimulation of labor (abbreviation -- KFOST). Collective forms include the brigade form of organization, but this is not all. The brigade is only one primary unit, the most widespread of the collective forms, but the KFOST encompasses all units.

An analysis of practice shows frequently when brigades are introduced there is opposition to the method. And sometimes brigades are created in such a way that the very idea is discredited. One encounters, for example, a formal approach: the workers are gathered together and told that from now on they will be regarded as a brigade. There have even been cases in which, in response to demands of higher agencies, brigade forms "encompassed" half of the workers in 2 weeks.

One also encounters such a method of justifying a passive attitude toward the creation of brigades as references to the idea that it must be voluntary. Of course, the success of any cause depends on voluntary participation in it. But this principle is also used to justify an unwillingness to introduce the KFOST: they say that the workers do not wish to be included in brigades and therefore the method is not being introduced. But in fact they frequently avoid careful explanatory and educational work. In reality the brigade is advantageous to the workers; it is just necessary to prove this, to find general interest, and to organize incentives correctly.

We are against purely administrative measures in creating brigades. The chief of the fuel equipment shop of the Altay engine construction production association, V. A. Ul'yanov, for example, tells what they can lead to: "I am well aware of my rights as an administrator. But if I try to take advantage of them and start to 'push' -- the people will leave, and there are not enough of them as it is. One time a young chap came to work in the shop. He had recently been discharged from the army. He asked not to be sent to a brigade for any reason. Why not? It turned out that previously, in another shop, he became a member of a brigade in which the 'old-timers' were always giving him a low coefficient of labor participation and assigned him the most difficult

operations, and the young chap had to raise a family. And he came to the conclusion: it is bad to work in brigades; one must think only of oneself."

Indeed, it sometimes happens that the intensiveness of labor, responsibility and discipline increase in a brigade. But the material incentives do not improve, but, on the contrary, are worse than for those who are not in brigades. And so the brigades fall apart. This situation cannot be allowed: if the contribution increases, the earnings should also grow.

The workers would be right to refuse to enter brigades if they are introduced without the proper preparation, formally, for the sake of the report. For their being voluntary is a mandatory prerequisite not only for the creation, but also for the effective functioning of brigades.

Sometimes it is stated in the literature that brigades are effective only in cases where complicated technical equipment is being used, which requires the joint labor of several workers, and it is impossible or inexpedient to divide the object of labor of the workers into individual elements or stages, and the technological processes require joint participation of workers of various occupations, increased collective responsibility and interest in the final results of the labor of the collective and so forth.\* From such a list one can draw the conclusion that there are conditions which primarily contribute to the creation of the KFOST. Is this not enough?

As was noted at the 17th Congress of Trade Unions, brigade organization can encompass all workers, and without any references to the peculiarities of the organization of production and labor. If brigades are formed first in places where the conditions are already favorable, it will subsequently be necessary to create such conditions.

#### Obstacles to Dissemination

There are several reasons for the slow dissemination of the KFOST. The main one is, perhaps, the fact that certain enterprises do not have a critical internal need for brigades. The dissemination of brigade organization does not involve an appreciable improvement in the indicators of economic activity. The rates of growth of labor productivity that are to be achieved as a result of the creation of brigades are sometimes such that with the present methods it is possible to achieve them as a result of other factors, for example, overtime. The result of such an approach is obvious: on the whole the work indicators of the brigade are not very different from the indicators with individual organization. Thus in Altay Kray and Novosibirsk Oblast from one-third to one-half of the brigades do not fulfill production assignments. The formal approach is shown, for example, by the fact that in many brigades there are no brigade leaders. And this is not surprising: why is one needed in a "brigade" consisting of two or three people!

\*See "Effektivnost' brigadnoy organizatsii truda" [The Effectiveness of Brigade Organization of Labor], ed. by A. Ye. Kogut, Leningrad, Lenizdat, 1980, p 6.

Therefore the skepticism is understandable: why introduce brigades if they do not produce an appreciable increase in labor productivity?

There are at least two answers to this. The first is clear: newly formed collectives do not have the conditions for increasing labor productivity, and divisions of labor and wages sometimes cannot find the funds for further incentives for increased output. But the possibilities of such growth exist for, as experience shows, the members of the brigade are clearly motivated to work with fewer people. With the proper approach, brigade organization can considerably increase output, but there are shortcomings in the payment and incentives for labor, and these are an impediment.

The second argument in favor of brigades consists in the following. Is this brigade form of organization really introduced only for the sake of increasing labor productivity? In addition to this most important merit, it helps to eliminate a serious contradiction: collective forms of labor correspond more to the socialist society and the nature of production relations, which is essentially collective. "Only in the collective," wrote K. Marx, "does the individual receive means which make it possible for him to develop all of his inclinations comprehensively...."\*\* If the aforementioned contradiction is eliminated, as a result one can count both on the desired increase in labor productivity and on strengthening discipline and so forth.

In the article "The Teachings of Karl Marx and Several Problems of Socialist Construction in the USSR," General Secretary of the CPSU Central Committee Yu. V. Andropov emphasized: "A nation which has completed a socialist revolution must then spend a long time assimilating its new position of being the supreme and complete master of all public wealth--it must be assimilated economically, politically and, if you wish, psychologically, by developing a collectivist consciousness and behavior."\*\* It seems that collective forms of organization and stimulation of labor today constitute one of the most important means for this assimilation, a solid and close union of "ours" and "mine."

On the whole, brigade organization of labor is a concrete school for educating workers, developing socialist enterprising, and strengthening order and discipline. The single order, autonomous financing, and the application of coefficients of labor participation make the workers more active and contribute to increasing labor productivity and developing thriftiness. The advantages of the KFOST are also manifested in the social sphere. Specifically, autonomously financed brigades working under a single order contribute to the formation of new interrelations in the collective, and a more harmonious combination of personal, collective and public interests. In comprehensive, all-around brigades they form collectivist ties among various categories of workers employed on various shifts. Hence labor turnover decreases. Increased labor productivity and improvement of payment systems contribute to increasing prosperity and, in turn, increase the motivation to achieve the final results.

\*K. Marx and F. Engels, "Soch." [Works], Vol 3, p 75.

\*\*KOMMUNIST, No 3, 1983, p 12.

Unfortunately, the social aspect of the brigade form of organization which, in our opinion, is very important for practice, is not always given the proper attention. Frequently in theoretical discussions practical workers too ask these questions: in modern production is labor really inevitably collective in nature? Is it really not a collective, joined together by technological processes, that works in a production section? Or is a group of designers not a kind of collective? And how does one account for the fact that in various branches of the national economy, especially in ferrous metallurgy, light industry and so forth, a large part of the workers worked in brigades long before the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979 concerning improvement of the economic mechanism? In general, can one speak about any sharp change from individual forms to collective ones?

In order to answer these questions, it is important to draw a line between cooperation in labor, which, with the deep division of labor, is undoubtedly necessary and exists, and the collective form of its organization. In the first case we are speaking about ties that are purely technological. But there are also socio-economic ties. Thus if a section assembles the final product, a collective is not automatically created in it. Individual piece-rate workers who are interested in personal output try to acquire primarily "advantageous" jobs, and some of them cover the output norm several times over. But the section as a whole might not fulfill the plan, and only the foreman bears responsibility for this.

The individual form of wages is retained in many brigades which existed before the publication of the aforementioned decree. We regard the present stage as a stage of introduction of new and renovation of existing KFOST's. It is not accident that when describing new brigades one emphasizes first of all the fact that they make it possible to eliminate the difference between "advantageous" and "disadvantageous" jobs. And each worker strives to increase not his own individual result, but the common achievements. Even the ideal of the worker is changing. The nature of individual organization is conditioned by a desire to increase output as a result of reducing the number of operations, adjusting the machine tool, reducing the time for replacing the instrument and reading blueprints. But in the brigade each person tries to learn to change from one operation to another, from one machine tool to another, and he does this willingly because this is necessary for the overall result.

The collective form of labor organization, with which each worker is worried about his own personal contribution while simultaneously taking into account the overall work of the brigade, is necessary not only for workers, but also for designers, technologists, bookkeepers, production foremen, and, possibly, the head specialists of the enterprise. Today engineering and technical personnel and employees have only the attitude toward the brigade form of organization that it is being introduced for others, perceiving it only as an additional load. For example, it is necessary to carry out a multitude of such jobs as restructuring the planning of material and technical supply, norm setting, reassessment of technological processes, and so forth. In the final analysis the success of the KFOST is determined by how engineers, technicians

and employees provide for its functioning. It would be expedient for the brigade to become a form of their labor as well. Incidentally, such experience exists, notably in the Novosibirsk Elektrosignal plant and among construction workers of Tyumen Oblast. It should be extended everywhere.\*

Here is what PRAVDA wrote regarding this in an editorial on 14 February 1983: "A very great deal depends on engineers and employees. But they sometimes seem to stand to the side and are not materially interested in the affairs of the brigade ... There are proposals to include specialists, wherever possible, in consolidated brigades, and to apply coefficients of labor participation when distributing bonuses and various kinds of additional payments for employees and engineers. One should obviously pay attention to such proposals. The more so since the experience exists ...."

In practice there are two approaches to introducing the brigade form of organization -- "in one shot" (immediate) and gradual. The former was applied, for example, at the Volga Motor Vehicle Plant and the Pavlodar Tractor Plant, but the later is much more widespread. As a rule, the ministries and departments distribute assignments for including workers in brigades for the various years of the five-year plan with a running total. There is a reason for this. But at the VAZ brigade organization was not introduced gradually, but at once for the entire enterprise. Would it not be expedient to do this everywhere? They might object: this is hardly possible. In our opinion, the introduction of brigades all at ones is effective after prolonged and careful preparation which involves all aspects of production. We have already seen that brigades that are created hastily not only do not convince people of the advantages of this form of organization, but, on the contrary, disenchant them. So it is expedient and possible to introduce brigades for everyone all at once if there has been long and comprehensive preparation, at least until the end of the five-year plan. It is precisely the preparation, which radically affects all aspects of the vital activity of the collective and production, that will make it possible to achieve an appreciable effect.

True, one can react this way to the example of the VAZ experience: this is a special enterprise. It is impossible to compare others with it, and therefore its experience is not convincing. There is no doubt that the plant in Togliatti is unique. But the AvtoVAZ association includes plants in Belebey, Dimitrovgrad, and Skopin. These are ordinary enterprises and all the workers there are working in brigades.

#### Scientific Preparation is Required

The plan for organizing the changeover from individual labor to brigade labor has already taken form in practice. It includes, as a minimum, the following measures: explanatory work, study of experience, engineering work, including a wide range of work for restructuring technology, planning, norm setting and so

\*See "Brigades in Production: Today and Tomorrow," EKO, No 10, 1981.

forth, the development of guidelines for the production brigade, the brigade council and the council of brigade leaders, the formation of brigades, and the creation of a special subdivision, for example a bureau for the brigade form of labor organization as was done at the Kaluga Turbine Plant. The range and volume of the work are great because this is not a simple matter and there are very many problems. And what is primarily needed here is scientific development, of which we clearly do not have enough. There is not enough scientific literature on problems of brigade organization. Several hundred brigade organizers who were questioned could not recall that anyone at their enterprise did a preliminary study of this question using scientific literature. One can understand the practical workers: they must introduce the brigade form, as quickly as possible, and they do not have time to study the literature. Science has not provided us with concentrated and intelligible developments. The lack of scientific preparation creates the possibility of negative consequences. Experience which is not interpreted by science contains the threat of serious mistakes.

Which questions that arise when organizing brigades are not sufficiently elucidated by science? There are many of them, but first of all for illustration we wish to discuss the distribution of collective earnings according to coefficients of labor participation (KTU) because it is precisely here that we find a multitude of contradictions and conflicts which sometimes contribute to the collapse of the brigade. One must say that the very term KTU is not altogether precise: the distribution is done taking into account not only the labor contribution, but also the behavior of the brigade member, his discipline, his participation in teaching work, and so forth. Consequently, it is more correct to speak of the KSU -- coefficient of social participation. But this is a trivial remark. Let us consider the mechanism for distribution which consists of raising and lowering the number of points. Here, in the first place, there are disagreements with statistics: one cannot add and subtract coefficients because the "weights" of the points change.

In the second place, the mechanism for distribution according to the KTU is negatively affected by the existence of minus points, which are regarded as penalties. The organizers themselves devote attention to this, and the workers react strongly. Let us say that from the results of the month the collective earnings of a brigade consisting of workers A, B, C and D, which are to be distributed according to the KTU, are 200 rubles; the KTU's of the workers are 1.2, 0.8, 1.1 and 0.9, respectively. If the earnings were averaged, each worker would receive 50 rubles, but when calculated according to the KTU, the earnings are 60, 40, 55 and 45 rubles. It turns out that in order to give to one worker it is necessary to take away from another. If the share of one of the workers of the brigade increases, it must correspondingly decrease for another. There is no other option. Instead of payment of labor (and social participation) it turns out that one worker takes from another and one gives to the other. This result is hardly in keeping with the goals that are pursued by creating brigades.

The minus points reflect the hopes placed by individual economic workers in the effectiveness of penalties for violations of labor, technological and production discipline. Yet practice shows the reverse effect. For one

absence, a worker at the Barnaul Boiler Plant loses his current bonus and "13th wage" -- a total of more than 400 rubles. After this, throughout the course of the entire year he loses nothing more if he is absent again.

Unfortunately, this preference for penalties has even been reflected in the terminology. We have in mind such a term as "debonusing" (deprivation of bonus). Instead of stating in the order: "For such and such services, to award a 20-percent bonus," they prefer: "For such and such violations, to withhold 20 percent of the bonus" (with a maximum of 40 percent). It turns out this way: in our minds we write 40 percent and subtract 20 percent from this. The principle of wages, however, requires something else: you receive as much as you have earned. Wages should be earned, and not added and then partially taken away.

On the whole the point system is not bad, and therefore it is widespread in the system of education, sports and other areas. But its implementation in production with the help of "fines" cannot but cause objections.

Let us use an example to see how the point system would look without this shortcoming. The conditions are the same: in a brigade of four workers the earnings subject to distribution are 200 rubles. It is necessary to divide them in such a way that there are no penalties, withholdings or transfer of points from one to another. In this case the worker will strive to improve his own achievements and to contribute to increasing the overall amount of additional earnings and bonuses.

Table. Evaluation of KSU According to Factors

Factors	Intervals of weight	Evaluations of workers' KSU:			
		A	B	C	D
1	2	3	4	5	6
Output	0.9-1.1	0.9	1.0	1.0	1.1
Quality	0.4-1.9	0.4	0.7	1.2	1.9
Qualifications	0.8-1.2	0.8	0.9	1.1	1.2
Tutorship	0.6-1.5	0.6	0.8	1.2	1.5
Discipline	0.2-2.0	0.2	0.6	1.3	2.0

Labor science suggests various analytical methods of organizing wages (see table). Let us say that the activity of each member of the brigade is evaluated according to any number of factors, but their weight is determined by coefficients in the range of from 0.1 to 2.0. By regulating the interval between the coefficients it is possible to stimulate the achievement of various indicators which are most important for the brigade. If, for example, there is no need to stimulate differences in output on the conveyor, the interval will be small -- from 0.9 to 1.1; but if it is important to improve

discipline, the coefficients will range from 0.2 to 2.0. If the brigade has newcomers, the interval between the coefficients for training work will increase, and if there are no newcomers and there is less need for training, it will decrease. The table gives the weight of factors and evaluations of the KTU with the assumption that for worker A they are minimum, for D they are maximum, and B and C are taken from the middle of the intervals.

Multiplication of the amounts in columns 3, 4, 5 and 6 gives 0.0346, 0.3024, 2.0592 and 7.5240, respectively, as points of the workers. By dividing 200 rubles by the overall sum of points (9.9602) we find the monetary value of one point -- approximately 20 rubles. Now it is easy to calculate that A will receive in addition to his regular earnings about 60 kopecks, B -- 6 rubles, C -- 41 rubles and D -- 150 rubles, 40 kopecks. In order for them not to feel the "withdrawal" and "addition," it is only allowed to multiply the monetary evaluation by the points of each. One cannot, for example, add  $6 + 41 + 150.4$  and, by subtracting this from 200 rubles, figure out the share of worker A. Although the result will be the same arithmetically, from the social standpoint it is principally different: each receives according to his merits and not what is left over after paying the others. It is necessary for the calculation to be as precise as possible (in the example it was done by rounding out the figures).

The proposed method of calculating the KSU is undoubtedly more complicated than the present one. But it seems that complexity is preferable to unjustified simplicity. It is also necessary to take into account that the workers are always experiencing a critical need to know how much they are to receive and for what. If they cannot learn to establish the weights of the factors which, moreover, change from month to month, it is here where assistance is needed from science. Workers in the Kalinin electrical equipment plant regularly work on point evaluations. Incidentally, if the points in our example were not multiplied, but totalled, the workers in the brigade would have received additional payments in the amounts of approximately 25, 40, 58 and 77 rubles. The difference is significant.

One of the serious questions is what to distribute according to the KTU. The standard guidelines allow the distribution of piece-rate additional earnings and bonuses. But practice shows that since the amount of this part is relatively small, the effectiveness of the stimulation of collective labor is not sufficient either. Apparently it would be more expedient to grant the brigades the right to distribute all collective earnings according to their own decision.

#### Brigades and Restructuring Production

There is another aspect which requires scientific preparation -- the determination of the size of the brigade. Judging from experience, the optimal size is 15-20 workers; if there are fewer, the brigades should be consolidated, and if there are more they should be broken down. But such a facile solution can hardly be justified. The optimal number of workers in a brigade is actually related to many factors, particularly the contacts among

workers. The number of workers in an installation brigade in one of the sections of the Aktyubrentgen plant, for example, was set at the proposed 15-20. But why did the workers calculate their output according to individual rates that are no longer in effect? It turns out that their working positions were separated from one another, and they were afraid that someone would transfer part of their work to others. This fear is quite understandable: the people have become accustomed to answering only for themselves, and this feeling does not pass quickly. It was necessary to take down the dividers in order for the workers to see how the others worked, and whether they were letting others do their work.

Lively contact among the members strengthens the brigade. Thus if the brigade form requires this, it is necessary to correspondingly rearrange individual elements of production and technology. How does one create a brigade of electricians or repair workers if in a modern plant, which spreads over hundreds of hectares, the production is served by only seven people who are always to be found in different places on the territory? This can be done if one introduces such means as radio and telephone communications, which will promptly provide the necessary contacts. There is nothing unrealistic in this.

Administrative science asserts that a manager should have only a certain number of subordinates. But how does one control a brigade of 50 people? Then the brigade can be broken down into several teams and these teams will be under the jurisdiction of the brigade leader. When evaluating the work according to the KTU, an additional factor is introduced -- leadership of the team.

Frequently we try to include in a brigade people who are as different as possible -- in terms of sex, age, skills and character. Experience shows that science is right to establish the necessary minimum of diversity. For example, if all members of the brigade have equal qualifications they have nothing to teach one another.

In scientific preparation for introducing the collective form of organization and stimulation of labor, it becomes very important to determine the prospects for the development of the brigades. Unfortunately, many of the guidelines for brigades which we analyzed do not contain a point which envisions a revision of the guidelines. For sometimes it is simply necessary for the brigade to be reshaped: if, for example, it is not receiving newcomers, if it "pushes" them out, thus establishing a lower KTU. The conditions for disbanding a brigade -- not random, but deliberate -- should also be stipulated in the guidelines. This is as important as the answers to other vital questions: what will be done if the administration does not meet the conditions of the contract? Who will make the final decision when there are conflicts regarding distribution according to the KTU, and so forth.

As was noted at the 17th Congress of Trade Unions, in order to give the "green light" to the autonomously financed brigade, it is necessary to continue the restructuring of the economic mechanism, to improve material and technical supply, and to fight against formalism in planning and accounting for labor.

Consequently, preparation should be multifaceted -- engineering, technical, technological, organizational, economic, administrative, legal, social ....

Let us consider certain aspects of it.

Is it compulsory when introducing brigades to carry out an essential restructuring of technical equipment, technology, and organization of production and management, or is it possible to limit oneself just to transformations in labor organization? It is understandable that the latter is easier and simpler, and the former involves more trouble, but this is the most important. Brigade organization is not a goal in itself, but a means of solving problems of increasing the efficiency of production and the quality of work, and also social problems -- instilling collectivism and strengthening discipline. The question of which changes are most expedient provides space for scientific research.

The design and technology of products that are produced should correspond to the principles of collective organization of labor. The Kaluga workers, for example, have changed the design of the turbine three times in order to enable the brigades to produce the final product -- prepared units. It is also necessary to change the means of labor -- machines, machine tools and instruments. For example, when working individually, the worker adjusted the instrument just for himself, and even hid it sometimes. But now, in the brigade, since interchangeability of workers is emphasized, the instrument should be easily readjusted. Nor can one do without restructuring technology. It is no accident that in engineering preparation a large place is assigned to recalculating the routes of items, replanning the working positions and so forth. Here, in a number of cases, it is expedient to go further. In particular, it is worthwhile to analyze labor organization on the conveyor, to construct circle conveyors, and to find other methods of organizing the production process, such, for example, as in the Rostov-on-Don Obuv' experimental production association.

One of the problems of organizational preparation is the training of the brigade leaders. For a dozen brigades one can find worthy leaders fairly quickly, but for hundreds of brigades they must be trained. But how is a brigade leader trained once he is selected? To send workers for training before the creation of the brigade means simply to appoint brigade leaders; but it is hardly reasonable to create brigades without having trained leaders. At the Novosibirsk Instrument Plant the changeover to brigades was postponed until the brigade leaders were trained. This was a correct decision. The following can be a solution to the problem: train several workers at once, and select the brigade leader from among them. And it is even better if the workers reach the level of requirements placed on the manager of a primary unit. The practice of having all the workers take turns at acting as the brigade leader is also worthy of attention.

Economic preparation has been difficult. Management workers can give as many examples as you like of how economics has been neglected for the sake of increasing output in the brigades. Naturally, a brigade does not want to stand idle if, for example, a machine tool breaks down. "Help yourself: here

is a reserve machine tool!" But before this, the reserve machine tool basically stood idle.... Or the brigade itself "plans" which items to turn in as completed and which to keep for a month or two, or even a half year. Labor and materials are frozen. Up until now there have been few autonomously financed brigades. In Novosibirsk Oblast only every eighth one was, and not even they were completely autonomously financed. For the system for real autonomous financing can be interpreted as follows: the collective is given a monthly assignment and money (or, rather, the right to spend it) for purchasing the necessary resources according to the normatives. Savings go into the "pocket" of the brigade; and overexpenditures come out of their "pocket." In any event they maintain a reserve. The reserve can be used to pay for a contract with the designer or the technologist for doing nonplanned work for the brigade. The idea of the brigade contract is becoming increasingly widespread and requires all-around support.

In administrative preparation there arises the question: how does one provide sufficient independence for the primary units that are created? Up to this point there has been extensive intervention of the foremen and shop chiefs in the "internal" affairs of the brigades. In guidelines on brigades one encounters entries of this kind: "The brigade leader is elected by a general meeting and is approved by the foreman." What is given with one hand is taken away with the other.... Increasing the independence of brigades in these matters was discussed extensively when considering the draft of the USSR law on labor collectives.

The position of the foreman changes essentially in the brigade. He has the opportunity to be relieved of functions that are not appropriate for him and to engage in planning, organization of production, and education. For this reason alone it is necessary to reduce the number of foremen, to increase the wages for those who remain, and to change them from "sergeants" of industry into "ensigns." But what will happen to the shop chief and his deputy? This is a fundamental issue. Abroad, for example, when introducing brigade organization, the lowered entire levels of the administrative hierarchy.

It is difficult to give formulas for all cases. But it is obvious that the structure of administration has to be changed. From the standpoint of administrative science, the enterprises should not simply introduce brigades, but should carry out a sequential changeover to collective organization of labor with the appropriate hierarchy from above to below.

One is not surprised by the fact that production workers frequently encounter legal problems because so far labor legislation is directed more toward individual labor. In a brigade a painter who works with aniline paints and a welder-assembly worker may be interested in helping one another, but the difference in evaluating their labor has been predetermined: the former occupation is included on the so-called privileged list, while the latter is not. Hence the obvious need for legal preparation, a study of legislation, and so forth.

When forming brigades one absolutely must take into account the socio-psychological, moral-ethical, psychological and pedagogical aspects. With the

introduction of brigades it will probably be necessary to change many interrelations. Thus the brigade leader sometimes goes directly to the director, bypassing the shop chief and the head specialists. What will happen with the latter? Administrative methods of management sometimes turn out to be ineffective, and it is necessary to use other, more suitable measures.

Today one can see a new upsurge of brigade organization, a new wave. It is distinguished from preceding ones by its scope. The upsurge will end with the strengthening of the KFOST if the expansion of collective forms of labor organization are regarded not as a goal in themselves, but as a means of solving social and economic problems. Having given the enterprises large assignments for increasing labor productivity and having granted them independence in carrying them out within the framework of collective autonomously financed forms of labor organization, one can be confident that all reserves will be put into action. Then it will not be necessary to check on the number of workers included in brigades. The reserves here, as practice convincingly demonstrates, are large.

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## INTEGRATED LABOR OPERATIONS EXPOSE INHERENT PROBLEMS

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 103-109

[Article by B. I. Fedorov, Rezekne ground transporter electrical equipment plant, Latvian SSR: "All-Around Contract -- 'Interdepartmental' Brigades"]

[Text] Even 5-6 years ago the all-around contract was a dream of enthusiasts. At the first all-union meeting of integrated brigades of excellent quality in 1976, they only raised the problem of introducing as an experiment elements of brigade autonomous financing in technological chains, but considerable progress has been made in this direction during the time which has passed.

On the basis of personal experience I wish to discuss the creation of integrated contracting brigades and the problems that arise with them. I think that it is necessary to deal with bad situations in industry.

The beginning of construction is the digging of the foundation. It would seem that there is no simpler work: dig out the dirt and send it away. There are no difficult problems. But if you look deeper you see that problems arise immediately, and added to them are socio-economic and organizational problems. Their main source is the existing division of labor.

A typical situation for construction: one overall job is done by two specialized organizations which are under the jurisdiction of different departments. As a rule, it is done slowly, primarily because the organizations working on the project (and there can be not two, but several dozen of them) have various indicators and interests. The construction workers try to add up as many cubic meters as possible, and the transportation workers -- to get credit for as many ton-kilometers as possible.

The combined labor of two different organizations employed in the same job is usually organized in the following way. The builders order motor vehicles for the day or for the coming week from specialized transportation enterprises. The vehicles are placed at the disposal of the foreman or supervisor of the construction brigade, who fills out trip sheets for the drivers for the day or week -- "he writes down the trips."

This same system was used to organize the work of the drivers at the facility we are discussing -- to ship the dirt from the foundation pit to the city hospital. From the first days there were shortcomings in the labor organization, which were expressed in the disparity between the volumes of dirt transported according to the documents and the actual volumes. According to the trip sheets, and they are filled out at the construction site, as a rule, on the word of the drivers, the transportation of dirt from the pit was in full swing. Actually, (this can be seen by looking at the pit) the work was proceeding at a snail's pace. In the majority of cases it was very difficult to check on the drivers, who were working individually, and the foreman, taking their word when filling out the sheets, had to distort the figures, attributing to them more trips than they actually made. They frequently used this to cover up shortcomings in their own work, and the impossibility or their inability to provide the drivers with a work front. It was possible, of course, to destroy the environment that supports distorted accounts -- the disorder in accounting or the lack of accounting, and the impossibility of checking on the results of the labor of the drivers. The volume and weight of transported cargo are known ahead of time, and at any moment it is possible to determine precisely, down to the cubic meter, the part of the work that has been done.

In order to counteract the tendency toward increasing the volumes of work by the drivers, the positions of accountants are being introduced, but this is not helping much. Even when all the trips are calculated with the maximum precision, the foreman can enter on the trip sheets a different, increased figure for the number of trips. Such situations can be found everywhere in construction. But the main thing is that the presence of the accountant at the facility did not improve the results of the labor of the drivers: they transported the same amount of dirt as before, and the only difference was that now they began to register fewer trips.

At first it seemed that the main reason for the low productivity of the drivers was psychological: they were pampered by the foremen of the construction brigades who were always giving them credit for extra trips. The management of the construction organization decided to take advantage of the services of another transportation association. But this measure did not produce results either: the labor productivity of the drivers did not increase.

One more attempt was made to accelerate the shipment of dirt from the pit: to assign permanent drivers to the project and to form them into a brigade. A geodesic measurement of the dirt was done at the site. There is a rate for each cubic meter that is shipped. It is multiplied by the number of cubic meters -- and this is the final sum of the earnings of the brigade. It is not necessary to keep track of the number of trips each day, and there is no longer a need for an accountant. In other words, they wanted to create a specialized contracting brigade. But this idea was doomed to failure. Primarily because the foundation for it remained the same as before, and it was technologically unsubstantiated in terms of distance or the number of kilometers. And the norms were taken from reference books, and did not take into account the conditions at the site. All calculations were done on the

basis of a 2-kilometer distance of trips. The daily norm for the drivers with this distance was 35 trips. This was disadvantageous because the actual distance was greater. And the entire contract became disadvantageous. Therefore the drivers refused to sign a contracting agreement.

Were the demands of the drivers justified? It is not difficult to check. To do this, their work was observed carefully, and time-and-motion studies were done for all of their operations. As a result it became clear that the established norm was too high. Even a certain hot-rodder who drives his vehicle mercilessly and violates all the traffic rules was only able to make 34 trips in a day. The others made 25-28 trips. The fact is that a lot of time was spent on the approach road to the excavator. Only one vehicle could be loaded at a time. It took as much time for a vehicle to back down into the pit, to be loaded and then to leave the pit as it did to deliver the dirt.

On the basis of figures from the time-and-motion study, the supervisor made an attempt to establish a more realistic norm -- 28 trips a day -- by artificially extending the length of the trip from 2 to 3 kilometers. Formally, this was also an element of distortion of figures. But this distortion, as we shall call it, neutralized the shortcomings in the norm setting for labor. It seemed that the new norm, based on the actual amount of time spent, should have suited not only the drivers, but also the managers of the transportation organizations. But dispatchers came from there, carefully measured the distance, accused the builders of distorting the figures and insisted that the trip sheet indicate the previous distance.

Without the distortions, the work on the project became extremely disadvantageous. During 3 months almost all the dump trucks from the automotive transportation enterprises had been at the site. They would work for a day, and then the next day they would try to go somewhere else. Sometimes a driver would arrive, find out the norm and how many trips his comrades were making, and immediately go to another site. The transportation organizations reacted to this by reducing the number of vehicles: once the norm is not fulfilled it means that there is no work front or complete loading. And the reason was simple -- the loophole for distortions was closed. So this time the automotive transportation workers did not manage to get "off the mark." And all this because their activity was in no way coordinated with the final result of the given cycle of construction -- digging the foundation pit. Measurements of kilometers and tons were important to them. And not even the real indicators, but figures concerning them on the trip sheets.

This is what comes from being unyielding. According to the calculations of norm setters and economists, which were based on the unrealistic norm of 35 trips, the pit could have been dug in 2 months. The drivers (with a norm of 28 trips) contracted to do it in 3 months. Fact: they have been digging the pit for a year already, and it is still not finished.

But let us imagine that a contracting brigade of drivers had been created (they exist in automotive transportation). Would it have been able to do the amount of work set by the agreement? The drivers from whom they tried to

create a specialized contracting brigade answered this question in the affirmative. But it is necessary to look at the situation realistically. Fulfilling the conditions of the agreement depends on the given situation -- and there is a great number of situations like this in construction -- not only of the drivers, but also of the other workers, mainly the excavator operators. It was the work of the excavator operators that set the pace for the entire technological chain. As soon as the excavator operators start to work poorly, the labor productivity of the drivers will decrease.

It is possible to solve this problem with a double contract, that is, to include not only the drivers, but also the machine operators under the contract. But two different specialized contracting brigades would begin to bargain for more advantageous conditions for themselves. Of course, each at the expense of the other. Moreover, the accounting, including brigade accounting, does not weaken, but strengthens departmental interests. This means that serious differences of opinion would arise, which would have a negative effect on the final results of the work.

Thus it is necessary to have an all-around contract which is based on common cost accounting indicators for two or more specialized collectives, even ones under different departmental jurisdiction. This is a common object, a unified work front, and an inseparable technological link between the specialized subdivisions, as well as production dependence of given construction cycles on other cycles and objects, and also complete loading of the workers for a prolonged period. All that is left to be done is to develop a unified technological process (YeTP) and, on the basis of this, to apply the piece-rate-plus-bonus payment for labor.

The role of the unified technological process must be especially emphasized. This is the basis for the integrated brigade contract, its foundation. For any contracting brigade, including an integrated brigade, the time period for performing the work is of decisive significance. If the brigade has kept to the time period, there is a bonus; if not, it goes without a bonus. Now the deadlines for work in construction, as a rule, are established on the basis of reference normatives, without taking into account the specific features of a particular project, which leads to serious misunderstandings. It is impossible to apply the brigade contract then. But the specific features of the project exert a strong influence on other links of the technological chain, in this case, on the excavator operators. While the truck is leaving the pit and another one is entering it, the excavator stands idle. It also stands idle while the bulldozer is pulling out a truck that is stuck, which happens frequently when it rains, and when the grader is clearing the approach roads. These losses of time are only partially taken into account in the reference guides. Consequently, for the excavator operators too it is necessary to develop a technological process for the given project, so that on the basis of it one can obtain a local technologically substantiated norm. It is even better to develop a unified technological process which takes into account the peculiarities of all links of the technological chain. Having arrived at the technological time required for 1 cubic meter (or ton) of load, one can also calculate the planned amount of time for doing the work.

It must be emphasized that the YeTP has not only organizational and economic significance (it is used as the basis for the establishment of substantiated output norms, time periods for performing work, amounts of bonuses and so forth), but also administrative significance. In the usual contracting brigade, control is exercised from a single center. In an integrated brigade this unified administrative center is lacking, and it cannot have one because it includes groups of workers who are under the jurisdiction of various departments. The all-around contract does not and cannot eliminate the structural independence of specialized brigades or teams within the integrated brigade. In the integrated brigade, for example, as distinct from the comprehensive brigade, there are no shifts of workers from one team (or brigade) to another: a driver cannot and should not replace an excavator operator, and vice versa. The YeTP designates who should do what and in what sequence. This means that the YeTP takes on many administrative functions and becomes a unique kind of replacement for the unified administrative center.

Integrated brigades can be created not only with a "zero cycle," but in practically all "stages" of construction. For in each of them the builders interact with the other workers, particularly with transportation workers, and in all cases it is necessary to have clear-cut regulation of relations among them. But not only "along the horizontal," but also "along the vertical," between the stages and cycles that are implemented by specialized construction organizations. The difference is only quantitative -- in the length of the technological chain, the number of links taken up in a particular cycle. In other stages the YeTP must be extended to the suppliers of the construction materials and equipment.

In order to develop "horizontal" and "vertical" YeTP's, it is necessary to have specialist-engineer-technologists in loading and unloading, transportation and warehouse work. There are none or very few of them at the construction sites, even though they are extremely necessary here. According to my calculations, at a construction site, say, of a hospital, such an engineer-technologist would have work for a week. Having created the YeTP, he would solve problems on which managers of construction and automotive transportation organizations have been working for more than a year.

Staffs of engineer-technologists could be introduced by reducing the number of foremen. Now at construction sites, as a rule, there are brigades with few members -- from five to nine workers. If there are from 10 to 20 people in the brigade, it also has a supervisor. In such brigades one administrative unit could easily be replaced with an engineering one. The same result can be achieved by consolidating the brigades.

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## CONFLICTS IN EARNINGS DISTRIBUTION IN BRIGADE LABOR DISCLOSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 109-113

[Article by E. S. Yarin, engineer, Altay Tractor Plant imeni M. I. Kalinin" Production Association (Rubtsovsk): "We are Awaiting Help From Science"]

[Text] Today brigades are being introduced everywhere, but a number of organizational and legal issues are still unresolved. Here are two of them.

The standard guidelines determine a number of characteristics of brigades, but they give no instructions about the numbers of people they should include, although this is extremely important. For example, in a smelting shop one can join together 5 molders from one conveyor, or 120 molders of all the conveyors, if specialized shift brigades are organized. But when creating comprehensive brigades, which include smelters and mold removers, the number can be increased to 150 people. One can find this kind of megalomania in some places. The organization of brigades of large numbers frequently produces negative results, and labor productivity decreases.

In the Altay Tractor Plant imeni M.I. Kalinin association, where about half the workers are joined into brigades, only 37 brigades include more than 25 people. Attempts to create large brigades -- from 80 to 100 people -- did not prove successful. Collectives with 15-30 people turned out to be the most effective. In larger brigades in series production sections there were difficulties in establishing the monthly KTU [coefficient of labor participation].

It seems to us that it would hardly be expedient to limit strictly the maximum number of people in a brigade. But it would be reasonable to develop recommendations for the optimal number of workers in brigades in various production conditions, taking into account the experience of the leading enterprises. The recommendations would help the enterprises and associations to avoid mistakes that undermined confidence in the brigade form of labor organization.

The second question is the distribution of collective earnings in the brigades that are working under a single contract. it is necessary for the distributed collective earnings to correspond fully to the labor contribution of each

member of the brigade. Levelling is not permissible here, because sooner or later it inevitably involves a reduction of labor productivity.

Recommendations for machine building and metal processing enterprises stipulate that the collective earnings are distributed in keeping with the ranks and the amount of time worked and, with the agreement of the brigade, in keeping with the coefficients of labor participation. Additionally, it is stipulated in a remark that when creating brigades of workers with various qualifications and various labor productivity, one can calculate temporarily for each member of the brigade the coefficient that reflects the level of his earnings during the past period (3-6 months). The same note was contained in the "Temporary Recommendations for the Development of Brigade Forms of Organization and Payment for Labor" which were previously in effect and were approved by the USSR State Committee for Labor and Wages and the secretariat of the AUCCTU in January 1979. It served as the basis for the practice which became widespread of calculating base KUT's that were not equal to 1.

In brigades that are working under a single contract, the necessary conditions are created for an objective evaluation of the labor contribution of each workers, since the influence of advantageous or disadvantageous work is eliminated. The application of base coefficients that are not equal to 1, calculated according to the method indicated in the instructions, reduce this advantage to zero, since the calculation uses the level of earnings that existed before the organization of the brigade, and does not take into account who was employed in advantageous and who was employed in disadvantageous jobs. Therefore when one cannot do without base coefficients that are not equal to 1, they should be regarded in such a way that they reflect most fully the level of labor productivity and quality of work achieved by each member of the brigade.

Base coefficients that are not equal to 1 are applied extensively, partially because the existing wage conditions do not fully correspond to conditions of brigade organization of labor. Comprehensive brigades join together workers who are paid according to various wage rates and wage systems (piece-rate, indirect piece-rate, time-rate-plus-bonus). These differences in wage conditions are not always sufficiently substantiated.

Thus in tractor and agricultural machine building adjusters are included with auxiliary workers and are paid at lower wage rates than machine tool operators are, either according to the indirect piece-rate or according to the time-rate-plus-bonus system. This makes it more difficult to introduce brigade organization of labor in mechanical processing shops and reduces its effectiveness. In our association, when organizing brigades, in individual cases the level of earnings of adjusters was increased because of the KTU. This causes dissatisfaction among the machine tool operators. In brigades where the ratio of the levels of earnings of adjusters and machine tool operators does not change, the adjusters do not work at full force and including them in brigades does not produce the proper effect.

In keeping with the recommendations for machine building and metal processing enterprises, the KTU can be used to distribute piece-rate earnings, all kinds of collective bonuses and material incentives, and also savings on the wage fund obtained as a result of released personnel. At the same time it is

stipulated that the minimum amount of the earnings of any member of the brigade cannot be less than the earnings according to the wage rate for the amount of time worked, with the exception of cases stipulated in labor legislation.

According to the Labor Code, when output norms are not met at the fault of the worker, payment is made according to the work that was done, and this might not be the minimum amount of earnings according to the wage rate. With underfulfillment of output norms, defective work and idle time which are not the fault of the worker, the earnings can be less than the wages according to the wage rate, but no less than the established minimum amount.

If the KTU is used only to distribute additional earnings and bonuses, the brigade which is working under a single contract, according to a comprehensive norm and rates, in practice cannot apply to its unconscientious members, who do not fulfill norms or perform defective work, those material sanctions which are envisioned by labor legislation.

In our association the brigades have been given the right to distribute all collective earnings according to the KTU, and the majority of brigades have made a decision that has been fully justified. Earnings are distributed according to the KTU at other enterprises as well. When developing branch guidelines it would be necessary, in our opinion, to take this experience into account. Also in favor of this decision is the fact that, according to the recommendations, the base coefficients are based on the average monthly earnings, and it would be incorrect to use them only for distributing additional earnings and bonuses.

There is no need to be too rigid in regulating the application of the KTU. For production omissions, for which partial or complete deprivation of bonuses is envisioned, the reduction of wages because of this, according to the recommendations, cannot exceed the sum of the bonus calculated for the given worker. The list of production defects is established at the enterprises and usually includes many of those shortcomings for which it is possible to reduce the KTU. The application of this point of the recommendations leads to a situation where in practice the brigade can use the KTU only for distributing bonuses. This considerably weakens the possibility of materially influencing the unconscientious workers and providing for a fundamental differentiation in earnings. The distribution of collective earnings according to the KTU is introduced in order to account for the labor contribution of members of the brigade to the result that was achieved in their work. Now, in keeping with the USSR law concerning labor collectives, the brigades have been granted fairly broad rights. By completely taking advantage of these rights they can provide for high personal responsibility of each worker for the overall result of collective labor.

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## READERS COMMENT, OFFER SUGGESTIONS ON BRIGADE LABOR

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 114-121

[Text] Base Methods of Introducing Brigades Needed

[V. P. Kuz'min, chief of division for organization of labor and wages, and A. I. Kostikov, chief of the division's normative research laboratory, Sibsel'mash Association (Novosibirsk)]

The country has accumulated many examples which can be followed when introducing collective forms of organization and stimulation of labor: the VAZ, Uralmash, Leningrad and Perm experience. The Kaluga variant turns out to be closest to many. On the basis of it the Sibsel'mash association, with the help of institutes of the Siberian Branch of the USSR Academy of Sciences during the past 5 years has managed to create about 600 brigades and include two-thirds of the workers in them. As a result, about 700 workers were released, and labor productivity is 10-15 percent higher in the brigades than in the association as a whole.

But we are concerned about the fact that a good deal of time is lost because of the lack of a unified methodology. In essence, each plant must adapt the methodological guidelines suggested by the ministry or department to the concrete production conditions. Frequently it turns out that they have re-invented the bicycle. The information is scattered, and individual seminars and conferences do not provide a complete picture.

It seems to us that the base methods can be created from the model of the base automated control system for production, which was developed by the Siberian Branch of the USSR Academy of Sciences. This system was created by highly qualified specialists, and it is on a higher level than individual plant developments. If from 3 to 5 years were spent on the development and introduction of the individual ASUP and it cost up to a half million rubles, the reproduction of the base model at individual enterprises has taken about 3 weeks and cost one-tenth as much.

Such base methods for introducing new and updating existing collective forms of organization and stimulation of labor should contain a description of the technology of each kind of work, methods for conducting it, documentation

concerning each type of brigade and administrative service which can be processed on electronic computers, and a schedule for changing the enterprise over to collective forms of organization and stimulation of labor.

The base methods would include recommendations from the Kaluga workers (for example, on the system of worker control), the VAZ workers (simultaneous comprehensive planning of brigades and their production zones and sections), and other collectives.

#### Master and Brigade Leader

[A.A.Gorel'skiy, candidate of economic sciences, docent, Tomsk State University]

At a number of enterprises it is possible to combine the positions of foreman and brigade leader, especially in collectives that are created on the basis of shop sections and divisions. For example, in the Sibkabel' Production Association (Tomsk) two variants were suggested.

The first was to change foremen and senior foremen into workers and appoint them as released brigade leaders. The form of payment is indirect, in percentages of the basic earnings of the brigade leader. The amount is set at no less than that of the most skilled worker. When working conditions change, the normative is adjusted. The bonus is determined, on the one hand, by the general brigade indicators and, on the other, by the personal successes or failures of the brigade leader. Its merit is the possibility of awarding bonuses to the brigades from the wage fund. It is best for such a changeover to take place for all-around collectives, in which the shift foremen are not under the jurisdiction of the senior foreman who has become a brigade leader.

The second variant is to leave the foreman in the category of engineering and technical personnel, on a salary, but to establish bonuses for him in percentages of the brigade bonus. There is less coordination of the interests of the foreman and the workers than in the first variant, but the idea itself is simpler and easier to implement.

A third variant is also possible -- to change the foreman-brigade leader over to payment according to the final results of the brigade, for example, to indirect piece-rate payment, but without changing him into a worker. If permission could be obtained from the higher agencies, this seems to be the most promising variant.

#### We Have Counted Five Problems

[V. S. Orlov, chief of the division of labor and wages of the Kostroma Electrical Machine Building Plant]

At our plant we have a number of problems, and if we do not solve them we can expect to return from the brigade form to individual labor. The first of them is the notification of assignments for reducing labor-intensiveness. The brigade has greater possibilities of increasing labor productivity than the individual piece-rate worker does, but there must be incentives for taking

advantage of these possibilities. The increased number of piece-rate workers working individually who do not fulfill output norms certainly does not mean that these norms cannot be fulfilled in the brigade.

The second problem is that the norm setting for technical processes according to existing branch or interbranch normative reference guides does not correspond to its purpose. Calculated (technically substantiated) norms are overfulfilled by 40 percent immediately after they are introduced in the brigades, that is, they should be made more difficult. But if the more difficult "brigade" norms are applied to all the workers, individual piece-rate workers may not be able to fulfill them.

The third problem is the temporary transfer of workers. Frequently the order for sending people to do agricultural work calls for one worker from each brigade. But there are 10 people in a brigade. The absence of 10 percent of the personnel sometimes leads to a drop in the brigade's production volume. To send the entire brigade is no solution either. Then certain items will not be produced because the brigades all produce different items: one -- press molds, another -- stamps, a third -- instruments, and so forth.

As a result, the workers again begin to prefer to take responsibility for carrying out their own operations and not for the overall product. A solution can be seen in the existence of reserve workers, employed individually, with time-rate payment, who could be brought into the brigade if necessary in order to retain its optimal composition. These could also be workers who do not fulfill output norms.

The fourth problem is that the changeover to brigades entails a reduction of the number of auxiliary workers and some of the basic workers, and thus the wage fund for the shop or section is reduced. The brigades are cautious about releasing it. It is necessary to take advantage of the limit fund for the five-year plan or to plan it in the form of a normative of expenditures per 1 ruble's worth of volume of output.

The fifth problem is that they have still not completely clarified questions of combining jobs for the basic workers: is the combined labor paid for fully or partially, at the rates of the first job or the added job?

What Can The Shop Chief Do ...

[P. G. Klivets, candidate of economic sciences, Dnepropetrovsk State University]

By the middle of 1982 in the Dnepropetrovsk area there were about 26,000 brigades, and 75 percent of them were working under a single order, 42.5 percent were using the KTU, and 4.4 percent had been changed over to autonomous financing.

Sociologists of Dnepropetrovsk University questioned more than a thousand workers and a large group of engineering and technical personnel regarding problems of brigade organization of labor. The shop chiefs of the Nizhnedneprovsk Pipe Rolling Plant imeni K. Libknekht (the base plant in the

Ukrainian SSR Ministry of Ferrous Metallurgy for innovations) said that, in their opinion, the most important were the conditions for changing over to brigade forms: the calculation of wages according to the report of the brigade council, the assignment of a category to a worker by the brigade, the assignment of equipment to it, the creation of brigade councils, the election of the brigade leader by the workers, and so forth. The reasons for the inadequate effectiveness are: interruptions in the supply of materials and instruments, breakdowns of equipment, low earnings and low skills of workers, understaffing with personnel, the lack of material incentives for repair workers, engineering and technical personnel and other time-rate workers, the unsatisfactory introduction of the achievements of scientific and technical progress and so forth. The measures necessary for eliminating the shortcomings are: improvement of the organization of production, the issuance of assignments to the brigade ahead of time, the updating of equipment, its repair, the provision of the brigades with everything they need, the elimination of distorted reports, strengthening of discipline, and educational work.

What can the shop chief do? A typical answer to this question is this: "The shop chief can do a lot ..." The shop chiefs of the Dneprovsk Machine Building Plant went even further: he can do practically everything to make the new brigade work efficiently. But the shop chief will also have to "spin his wheels" more. Is this not why not everyone is willing to introduce brigades? Several hundred of the engineering and technical personnel who were questioned placed the restructuring of planning with an orientation toward the final results and the creation of group working positions last among the conditions for organizing brigades. The majority of those questioned -- foremen -- would deprive brigade leaders even of such rights as the distribution of bonus funds. The minority -- shop chiefs -- were in favor of extensive rights for brigade leaders.

#### The Coefficient of Labor Participation in Sewing Production

[M. G. Shvartsapel', director of the Odessa head gear factory]

The production technology and the normative base in the sewing industry contribute to accounting for the individual achievements of members of the brigade. Here is how the KTU is determined in our factory. We use:

the coefficient of working time,  $K_t$ , which is calculated as the ratio between the time worked by each worker and the planned amount of working time for the current month;

the output coefficient,  $K_v$  -- the ratio between the percentage of fulfillment of the output norm by the worker and the average percentage of fulfillment of the output norm by the brigade;

the coefficient of qualifications,  $K_k$  -- the ratio between the average rate for work performed by a member of the brigade and the average rate for work performed by the brigade as a whole;

the coefficient of labor quality,  $K_t$  -- which determines the level of social recognition of labor and the KS UKP calculated on the basis of this.

The coefficient of labor participation is found by multiplying all the coefficients.

The first three factors are considered from bookkeeping data. The quality of the labor is evaluated on the basis of schedules of daily accounting in keeping with the standards of the enterprise. Any remark entered in the schedule and submitted to the machine calculation station automatically reduces the KTU. This system has been in effect at the enterprise since December 1981 and has been approved.

#### The Janitor Brigade

[M. A. Telyak, senior engineer of the bureau for introduction of the experience of the Volga Automotive Plant (Vitebsk)]

At the Vitebsk television plant a shop has been created for cleaning and maintenance. Its chief is under the jurisdiction of the deputy director for social problems. There are three workshops in the section: for service and living premises, for production premises, and for policing up the territory and planting greenery. There are no functional services in the shop structure. Representatives of plant services are assigned to it -- norm setters, economists and so forth.

The brigade is headed by an unreleased brigade leader. He is given a monthly normed assignment. He assigns the janitors to their work zone, checks on the quality of their work and their observance of technology, and determines the individual contribution to the collective result. The comprehensive brigades include from 5 to 20 people. They also include people on duty in rest rooms and those in charge of cloak rooms. The object of service here is the entire physical plant. The foreman can transfer a worker from one brigade to another. Many factors are taken into account for norm setting: the degree of dirtiness, the area and so forth. Each day the foreman evaluates the quality in points. At the end of the month he finds the average number of points.

As a result, the labor turnover of the janitors has decreased by 30-35 percent, labor productivity has increased by 60 percent. Expenditures on wages for janitorial work have decreased, and the earnings of the janitors have increased.

#### In Full Force

[Ya. M. Kachanov, candidate of economic sciences (Balabanovo, Kaluga Oblast)]

Brigades have existed for a long time in the chemical, pulp and paper, and other equipment industries. A great deal of significance is attached to their formation. It is best when a unified comprehensive brigade includes workers of the flowline section with payment in terms of the final product. Comprehensive brigades include both basic and auxiliary workers.

At certain enterprises that produce chipboard there are all-around brigades which include 20-25 people. Their merits are well known. But they also have difficulties. Thus it is necessary to account for the expenditure of raw and processed materials for the various shifts, for otherwise it is difficult to determine the contribution of each shift. In order to require an equal return from the shift teams, they must be given equal conditions (numbers, qualifications, provision of raw material, repair equipment, and so forth). One can not always manage to do this, and hence there arises a multitude of conflict-ridden situations. They are related to the imperfection of the system for accounting for the expenditure of raw and processed materials, the change of shifts, the inadequate participation of the administration in the planning of brigade jobs, and the unsatisfactory moral and psychological climate. Nor is it always possible to place equally strict requirements on all the shift teams.

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## EXPERT DISCUSSES FUTURE DEMANDS OF ENGINEERING PROFESSION

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 122-140

[Article by G. S. Migirenko, winner of the Lenin Prize, doctor of technical sciences, professor, head of the department of theoretical and applied mechanics of the Novosibirsk Electrical Engineering Institute: "The Engineer of the Future"]

[Text] The author of this article, G. S. Migirenko, was graduated from two higher educational institutions, including the Naval Academy. He began his pedagogical work in 1937. He fought with the Northern Fleet as a senior ship engineer. After the war he entered graduate school. He defended his candidate's dissertation, which was supervised by P. F. Papkovich, a corresponding member of the USSR Academy of Sciences, in 1949 and immediately entered the doctoral program of the USSR Academy of Sciences. He defended his doctoral dissertation in 1953 and has been a professor since 1958.

G. S. Migirenko came to Siberia along with Academician M. A. Lavrent'yev. Since the first years after the creation of the Siberian Branch of the USSR Academy of Sciences he has worked as a department head and deputy director of the Institute of Hydrodynamics. He was also secretary of the combined party committee of the Siberian Branch of the Academy of Sciences.

"There is no doubt that for correct education of modern youth it is necessary to instill creative capabilities in them, and this must be done taking into account the person's individual inclinations, beginning with the school desk and continuing into higher educational institutions. This is a fundamental task, and the future of civilization can depend on it, not only in one country, but on a global scale." -- P. L. Kapitsa

An engineer in production is basically an operations worker and not a researcher. He has been trained to use the available technical equipment and

to provide for the normal course of production in keeping with the given technology. Frequently his daily work leaves him no time for thinking about radical changes in technical equipment, technology, production organization, and so forth. But it also happens that "current business" is only an excuse for not working on scientific and technical progress. The reason is the inadequate knowledge of what is new and advanced. As a result, there arises what I would call a psychological educational barrier to technical progress, which impedes its development. Herein lies one of the reasons why it is not carried out properly at the plants.

As practice has shown, at leading enterprises in our country and abroad, technology changes radically every 5-6 years. That is, the time for acquiring a higher education corresponds to the time it takes for equipment to become obsolete. This means that if a student studies technical and technological devices even of today, his knowledge will be outdated by the time he begins independent work. And during the entire period of his work activity technology can change radically 5-6 times.

This happened to me at the end of the 1930's. We were taught the fundamentals of civil ship building, which originated at the time of Peter I: we installed the keel and the longitudinal beam, affixed the ribbing, stringers, sheets and so forth, that is, we assembled the ship step by step, in sequence. But I was assigned to a military plant with advanced technology where the assembly was done according to an entirely different technology. And I was firmly convinced that certain of the courses offered to us did not contain the main thing: they did not teach us to deal with qualitative changes in technologies.

Later, when serving in the Northern Fleet, I found out that the Americans had assembled some ships that could hold 15,000 tons (Liberty, Victory) from large blocks in 3 days. They were built with the idea that they would be rapidly replaced with more effective ones. I think that this is correct.

At one time a ship could sail for 50 or even 100 years. With time the maximum service life of a ship decreased to 25 years. But now it is unprofitable to operate the same ship even for 25 years, putting it through a serious of repairs. Ship repair (and, possibly, capital repair of motor vehicles) with time is disappearing from the category of labor, since for a ship to break down for an extended period of time entails immense economic losses. Of course one cannot eliminate repair immediately, but it has long been time to change over to block repair. Individual mechanisms should not be repaired, but immediately replaced. But when I have visited shipyards I have noted with surprise that blocks are still not being used properly there. I think that the orientation of plant engineers toward the customary, although ineffective, technology has played no small role in this. The situation must be radically changed.

One can speak about continuous introduction of new technical equipment and technology and the reduction of the time periods for this only if the corresponding specialists are already familiar with the new equipment and technology that is coming to the plant. Now, unfortunately, a new machine

frequently has greater capacities than the enterprise can use -- since there are no trained specialists. This is what happened, for instance, with electronic computers.

Modern production is critically in need of specialists who are prepared for sharp changes in technologies and are capable of modelling and predicting the future. How does one acquire such research engineers for industry? I shall try to formulate certain conditions which are necessary for their training.

#### "By the Piece" Selection of Youth

Perhaps one of the most difficult tasks is the selection of youth for the VTUZ. Certainly not everyone who has a secondary education degree can be trained to be a real engineer (which is true of specialists of any profile). It has long been known that there are few incapable people, but their capabilities vary. The sooner a person figures out what truly attracts him, the more gifted engineers, scientists and organizers there will be.

Early determination of inclinations and differentiation of training. In the opinion of M. A. Lavrent'yev, during the first 6-7 years, as is now the case, one can teach everyone a little bit of everything. But even during these years the teacher must pay careful attention to what the child is most interested in. And beginning in the eighth grade they should introduce differentiated training, in keeping with interests and inclinations. For instance, one could have four "departments": physics-technical, physics-mathematics, chemistry-biology and humanities (social sciences). We have specialized schools in our country, but there are not enough of them, and so far they are not much different from the ordinary ones.

This training is certainly not specialization as is found in VUZes. Here they only reinforce the interests of the school child and develop his independent thinking in a particular area. Of course it is also necessary to study other sciences besides the main one, but with varying degrees of detail.

Academician Lavrent'yev thought that even grades had to be differentiated with this kind of training. He liked to give this example. At the end of the last century, the eminent scientist A. Poincare was studying in a polytechnical school in Paris, which was created by Napoleon. When it came time to enter the second course he lacked almost half of the necessary points for promotion, and they should have failed him. But in the academic council it was explained that this student had had exceptionally high scores in mathematics and physics, but he had none at all in drawing. The academic council released him from drawing not only when he was promoted to the second course, but for all the rest of his education. This caused no harm to A. Poincare's education, and the reputation of the French polytechnical school did not suffer either!

In essence, grades are a very crude instrument for determining knowledge and quickness. They compare the school child's knowledge, on the one hand, with some standard, say, the extent to which he has learned the textbook by heart, and, on the other, with the "average" knowledge of the group. But many students lose out because they are always being judged by that merciless method that is based on "average" indicators, which requires no effort of

intellect and does not make one work. With this kind of teaching there is the danger of reducing a person's intellectual capacities. It is necessary to constantly check on the rates of increase of the creative capabilities of the person being trained and to compare them with yesterday's level, which is done extremely rarely.

Help for the school on the part of the VUZ. Now the school does not adequately develop or evaluate the independent thinking of the students, and therefore to finish school successfully is not a sign of their real capabilities. I had occasion to teach the theory of elasticity in one of the Leningrad VUZes in a group consisting of medal winners (gold and silver). Some continued to receive excellent grades, but there were also some C students.

Incidentally, it is easy to criticize the school, but it is more difficult to help it. How could this assistance from the higher educational institution that is interested in the selection of capable youth be manifested? Scientists must regularly give lectures in courses for retraining teachers and in senior courses of pedagogical institutes. Teachers should be enlisted more extensively in the work of VUZ departments. It is quite possible to organize the teaching of mathematics, physics and chemistry in senior classes, enlisting graduate students and especially successful senior classmen. Such participation would be useful not only to the school children, but also to the teachers themselves, since in order to explain the basic laws in science, to substantiate them theoretically and experimentally, one must have a good grasp of this oneself.

Two-year study groups in various disciplines are becoming a tested form of VUZ work with school children, which makes it possible to become acquainted with the future students ahead of time in order to determine their inclinations, to deepen their knowledge, and to clarify their orientation. These are being started in institutes, schools, houses of culture, and so forth. They are led by docents or graduate students. But, of course, they can appear only in cities where there are VUZes that are interested in high-quality selection of future students.

But how does one reach children who live in regions that are far away from the VUZ center? For instance, once a month a representative of the higher educational institution could come to these population points and give lectures. Education workers could prepare for such meetings ahead of time and select interested students from the various schools. Subsequently they could send them assignments and hold competitions through the rayon VUZ organization.

The prospects of a three-stage competition in mathematics, physics and chemistry are shown by the experience in conducting them at Novosibirsk State University (NGU). The university has created a permanent system of active selection of capable youth throughout the entire territory of Siberia and the Far East, and parts of Kazakhstan and Central Asia. The first stage is a correspondence competition in which problems in mathematics, physics and chemistry drawn up by the Siberian Branch of the USSR Academy of Sciences and

NGU are sent to the various schools and city and oblast public education organizations. In the second round the best school children come to the nearest oblast or republic centers. Those who have achieved high results are invited to spend August in the summer school in the Novosibirsk Akademgorodok (the third stage). It ends with a third round of competition, when the children are selected for the physics and mathematics school (FMSh). Here they try to develop in the children the main qualities of a scientist and research engineer -- the ability to observe, to pose problems and to work on solving them.

In my opinion, the majority of VUZes can create correspondence and even in-person specialized schools. For example, at the Novosibirsk Electrical Engineering Institute (NETI) we are now preparing to open a correspondence, and in time, an in-person physics and mathematics school. So far there are no more than a dozen of them in the country.

Utilizing these and other forms of work with youth, the VTUZ can promptly form a contingent of its future students who have demonstrated an inclination and special ability in the given area of knowledge.

Entrance examinations are not necessary. Let us turn to simple arithmetic. The NETI annually admits approximately 2,500 students. There are about 200 schools in Novosibirsk. If in each of them we were to organize study groups for the 9th and 10th grades, say, of 15 people each, and if we were to work actively with the boys and girls for the next 2 years (those who ended up in the groups by chance would be weeded out during this time), then it would be practically unnecessary to examine them. The leaders of the groups and the teachers would give a recommendation to each graduate and credence should be given to this. The same thing can be done with admissions to the FMSh. As a result, we would accept only those who are suitable for the institute. In general there would be no need for competition. And it would gradually be eliminated. Judge for yourselves. In many higher educational institutions the ratio between those who have applied for admission and those who are enrolled has stabilized at the level of 1:5 and does not provide a reliable basis for selecting suitable youth. There is no need for a rigid admission plan if the institute selects truly capable young people. For now we only give the appearance that it is being fulfilled, because in the first session almost three out of ten who are admitted have to be dismissed. The department bulletin boards are filled with orders concerning people who have been expelled...

Each of us has a right to an education. Nobody will argue with that. But one must study according to one's capabilities and inclinations. It is economically advantageous to the society for each member to hold a position which corresponds to his individual nature, inclinations and curiosity. And here "by the piece" selection of future specialists should play its role.

The leading VUZes of the country long ago ceased to give the classic examinations according to tickets. In particular, the Moscow Physics Engineering Institute gives discussion-examinations. For each person who has come and received at least a satisfactory grade in mathematics and physics,

the decisive test is the conversation with two or three examiners. It is here that they reveal the level of development of the applicant, the nature of his capabilities, and his inclination toward scientific thinking.

#### How and Whom to Teach

And so those whom we have selected for the institute "by the piece" we shall subsequently teach to think, for the soil has been prepared for this through the preliminary work. Teaching should not demand formal parrotting of the material, but should instill creative capabilities in the young people. K. Marx said: "Life does not ask what you have learned, but it pointedly asks what you know."

As a rule, people of creative labor are most satisfied with their work: scientists, writers, artists, directors and so forth. They usually do not divide their time into working and nonworking, and they live their work.

And any work can be made attractive and interesting if it contains an element of creativity. Of course, the creative process must be understood in the broad sense here. It is manifested in any activity when a goal is set for a person and he does not have instructions, but must decide for himself how he should achieve this goal.

Any beginning is difficult. This is also true of the beginning of creativity. This is perhaps why the ability to create has always been considered a gift. But our task is to introduce this to a mass of young people. This means that it is necessary to inculcate this drive toward creativity. And the drive is manifested as a result of profound conviction.

A person who has conviction does not need to be pushed or admonished. He will work hard, accumulate knowledge, and search for and find solutions. Even the ancients emphasized that "conviction, although it does not have the external form of necessity, does have the same force as necessity."

How indeed does one help a student to understand what he is studying? Experience shows that the educated individual, in the final analysis, knows only the main points in a broad range of disciplines, but in his profile the volume of his knowledge can be incommensurably richer and deeper.

It is very important to see what is invested in the very concept "to know." There are people who have an excellent knowledge of the formulations of hundreds of theorems, and can recall what has been written about them and where. They have read so much that they have "beaten down" their own creative capabilities. The science which these people study frequently seems to them so perfect that, from their point of view, nothing principally new can be added to it. They are capable of spending a great deal of time on proving that there is not enough experimental material to solve a particular problem. And there are others who deeply feel the "core" of science. For example, I knew one such individual from the Institute of Hydrodynamics of the Siberian Branch of the USSR Academy of Sciences. He was constantly generating the most interesting ideas based on the fundamentals of physics, but he could never

formulate his theory precisely; he had to turn to reference books for this. There is also an intermediate category of people who have fairly profound knowledge and are fairly successful at being creative ...

Under modern conditions a landslide of information falls down upon man. A huge number of books and articles have been published about so-called "crises": information, overpopulation, the generations, minerals, and so forth. In my opinion, they show the critical need to change our approach. There are two solutions, for example, to the information "crisis": strengthening fundamental education and developing the ability to choose what is truly important from the totality of information that is available.

Fundamental education. I am convinced that there is no modern engineer who does not have a profound knowledge of general educational sciences. Science as a whole is immense, but the number of basic laws does not exceed 100. A firm knowledge and mastery of them create the skeleton for fundamental education. It forms convictions and philosophies, and makes it easier to comprehend knowledge from related areas. Without this it is impossible to understand the majority of special (theoretical) and applied (technical) sciences.

Special and applied disciplines themselves must be filled with propositions from fundamental sciences as a result of eliminating purely technical devices; the main things must be singled out, while weeding out what is secondary; it is necessary to present not so much processing devices and technology as the tendencies in their development and views toward the future.

It is not necessary to give a tedious and not very effective description of, say, the arrangement of an engine. Only the theoretical foundations of its creation are necessary. What is joined to what in one instrument or another is quickly learned in specific work if the idea of the device is clear. I recall with melancholy the tiring and not very useful courses covering hundreds of hours which included discussions of what should be made from what, how and where something is placed, where it is taken from, how it is broken and repaired ... Unfortunately, such teaching is not always a part of the past. Therefore a strong impression was made on me by the coincidence of ideas expressed in two independent speeches before students by the deputy head technologist of the largest Novosibirsk plant and a scientist of the Siberian Branch of the USSR Academy of Sciences. The idea amounted to one thing: "About the technology of aircraft construction (the other spoke about machine building) I shall not begin to tell you. It is better for you to become acquainted with it by working at the plant. We shall speak about how it should be developed."

Thus the fundamental sciences should not so much increase in volume in the training courses as become an effective basis for specialized and technical disciplines that are taught in the higher school.

The time has come to create VUZes of an entirely new type -- technical or engineering universities. They will train specialists in the area of technical equipment who, when they come into production, will be able to and

will want to engage in long-range problems. We are trying to make the NETI such a VUZ.

The principle of the basic unit. An amusing phenomenon has taken place in NETI. We changed the presentation of the program for theoretical mechanics and resistance of materials, concentrating the students' attention on the key problems. But they, having profoundly understood the basic laws of mechanics, became fascinated, and they began to study everything else for themselves, as well as to study the books. Here is the impressive effect of the principle of the basic unit.

After any kind of reduction, any course can always again be divided into three groups: A, B and C -- main, auxiliary and secondary. Or, better, most important, important and less important. Of course, every time this procedure is carried out it is more complicated. One should pay no attention to assurances that the programs approved by the entire hierarchy of responsible groups and individuals all belong to group A. It can be changed into  $A_1$ ,  $A_2$  and  $A_3$  according to the same principle. True, it is not so simple to implement this principle in practice, and the discussions are frequently prolonged. One can find skepticism and nihilism and self-confidence, and simple differences of opinion about what should be considered major.

Then what is selected as major must pass through all the training forms: lectures, practical studies, laboratory work and quizzes, course projects and examinations.

A taste for learning. Of course, a person who has not experienced the charm of learning and an interest in accumulating knowledge cannot be cured immediately. Persistence is necessary. Any science is interesting in terms of its harmonious proportions and the beauty of the results that are received. If these are noted and emphasized, it is easy to attract a person. In each specific case it is necessary to find a way of showing that what has been received is interesting and important, and the consequences to which it will lead.

In the department of theoretical mechanics and resistance of materials we frequently show slides, for example, on the destruction of the Oklahoma bridge, flights to the moon, dolphins swimming, and the creation of universal means of transportation for Siberia. They arouse interest in the subject. Naturally, before showing these pictures, what is going on in them is interpreted in the language of theoretical mechanics and resistance of materials. As a questionnaire of students in the second class of the aircraft construction and machine buildings departments of NETI showed, in terms of attractiveness they placed theoretical mechanics in first-second place among the other disciplines; in terms of importance -- second-third place; in terms of difficulty -- third-fourth place; and in terms of the amount of time spent preparing for the examination -- fourth-fifth place.

Understanding is followed by imagination. Actually, they are dialectically related: if you have understood, you can imagine, and if you have imagined -- you will understand. "... Imagination and intuition, used within reasonable

limits, are still a necessary auxiliary means for a scientist and for his forward progress," said the French physicist L. De Broglie. Helping a student to develop imagination amounts to directed clarity. To force him to imagine what you are discussing, as if to see space and movement, the effect of force and momentum -- this is great advancement in the formation of a creative engineer.

Yet students rarely ask questions. And, as a rule, this takes place not from knowledge of the subject, but rather from a lack of knowledge. Worst of all is when it seems to you that everything is clear. "Doubt everything," K. Marx liked to say. This means that there is no need to canonize a scientific result, to turn it into dogma.

Intuitive thinking. Intuition is no less important. It is developed mainly through continuous work: observations, reading, analysis of facts, the disclosure of links among them, the breaking down of phenomena into particulars, and the location of what is common within and among phenomena. Extremely strong intuition borders on foresight and prognostication. One might say that intuition is small-scale foresight, and foresight is large-scale intuition.

Intuition gives many scientists the impression of the suddenness of the appearance of a riddle. "How frequently a discovery has been an accident!" exclaims F. Joliot-Curie. But for some reason these accidents do not happen to people who have not thought, have not searched, and have not worked endlessly. A. Poincare thought that he discovered theorems first, and then proved them. The concept of empathy (a method of intuitive cognition) is now current. Developments in this area belong to A. P. Sopikov, who sees in intuitive thinking reserves for pedagogy and an immense storehouse of man's creative forces. It is thought that the brain, having received information, is capable of constructing a subconscious model of a phenomenon, and it also contains information which was not communicated. It is natural to ask where it comes from. I think that this is a matter of dialectical conjecture, which gives rise to surmising and guessing. Cognitive empathy is more typical of children than of adults. It is our sacred task to develop intuitive thinking in youth.

Up to this point we have been discussing how to organize lectures more efficiently. But we should not forget about the immense significance of seminars, course and diploma projects, examinations, and especially -- the scientific research work of the students.

Nonlecture work of the VUZ. The problems which are assigned in books far from always develop independence of thinking. For them it is usually sufficient to place the figures in the necessary formulas in order to obtain an answer. Independence is manifested only in correctly selecting the formulas. It is necessary to make the problems more difficult, leaving it up to the student to select the appropriate amounts and solution. When there is no obvious solution, as a rule, the problems evoke lively discussion and the students like them better.

Some teachers like to "fire on" the students with rounds of problems. I think this is wrong. Experience shows that it is sufficient to select from each main section of the course, say, 25 typical problems which are typical, profoundly developed and important to the future specialists. They should also be given on examinations. It is better for the students really to know this limited number of problems, than only to try to know hundreds of them.

Recently I included on the examination forms (true, for strong groups) questions which required a firm understanding of the essence of the main laws of mechanics as well as contemplation of phenomena of nature and technology. For example, how does one explain the soft landing of the automatic space ship on the moon, what is the braking path of an aircraft, and what kinds of movement can be carried out by a ship or helicopter? The experiment was successful.

Now we give the students homework for calculating farms, and in order to make sure that they do not copy from one another, we give each of them his own farm. But it is much more effective to give a group of 4-5 students some general farm and require that they optimize it for a changing system of forces. In laboratory work we try to obtain what we are supposed to obtain. Is it not better to search for that which "should not" be? A course project should teach the existence of variants and optimization, the search for the new, disputes and juxtapositions of various opinions, and competition for the best.

Many scientists and pedagogues have long been calling for sharply increasing the proportion of the independent studies of students and entrusting more to them. It is much more important to teach them to direct all their efforts toward the development of a difficult subject than to give them some particular amount of knowledge. Therefore we should more boldly set for students scientific research projects that are within the range of their capabilities. Then they themselves will turn to the text books and primary sources, and they will not walk, but run for advice.

Scientific research work of the students (NIRS). Everyone who is capable of studying in a VUZ should engage in this. Some -- in order to acquire a taste for learning, and others -- in order to learn to utilize their creative capabilities as quickly as possible. I am convinced that this is no less important than training and educational work in the VUZ. NIRS should become just as widespread as, say, student construction brigades.

Our department utilizes about ten forms of NIRS. These include student competitions, scientific discussion groups and conferences. We send many students to academic scientific research institutes where they communicate with eminent scientists. But the basic and most widespread form is work in student design bureaus (SKB). Two SKB's have been created: for 35 and 15 students.

Students in the SKB participate in the planning of nonroad means of transportation, make experimental models and test them. Here they learn daring and resourcefulness, all-around evaluation of the plan and design, and

the struggle against "habit," and they master modern means of creating new machines and technologies. This is based on mathematical experiments carried out on electronic computers, in which the optimal variant is selected as a result of sequentially varying the qualities of the machine, the conditions for its operation and the properties of the environment.

Now, when planning an aircraft, for example, the students determine the consumer qualities of the future plan, even if they are not completely realistic. Then a mathematical model of the conditions for operation is run through an electronic computer. Possible variants are described, which are distinguished by various advantages. They draw up preliminary plans and refine the set of properties, which are determined by the possibilities of their technical realization. All these variants are again run through an electronic computer and compared with the best models. As a result of extended sorting, several of the best variants are selected and a decision is made concerning their sequential or simultaneous realization. This entire procedure of decision making is the future method of planning any object. And so, cybernetic planning -- variants -- the optimum -- experimental verification. In this process youth are taught to think and master a creative approach. This is the way the work of our SKB is arranged.

One of them is working with the universal hydroplane transportation in which the petroleum and gas workers are so interested. For example, 20 of these hydroplanes, which travel 50 kilometers an hour (the distance from one compressor to another), can at any time of year check on 1,000 kilometers of pipeline per hour.

Students who work in the other design bureau are creating equipment and sets of equipment for air cushions (AVP). The AVP should not be regarded only as a means of transportation. It is possible to create an entire "collective" of equipment for the air cushion, which is capable of digging trenches for pipes, taking the pipes to the places where they are to be laid, welding individual parts, and filling in the trenches. Along with the equipment, a hotel is also moved on the air cushion.

First the student study the literature, and then the final goals are made clearer to them. They fantasize, defend their ideas in discussions, plan, construct mock-ups and test them. These student design bureaus direct the youth not toward slow improvement of what already exists, but toward qualitative change and rapid progress. Our age is a time not so much of continuous streamlining, as of increasingly frequent exchange of outdated implements of labor with new ones. M. A. Lavrent'yev, for example, demanded that scientists and engineers search for new things which are distinguished from that which has already been discovered not in terms of percentages but in terms of hundreds of percentage points.

The highest form of NIRS, in my opinion, is the participation of students in the introduction of the department's developments at enterprises. Here they see clearly that, in principle, no scientist is capable of giving an enterprise a device which can be included in the technological chain while in operation and immediately begin to work. The introduction of scientific ideas

is a common cause. The production engineer must become a direct participant not only in setting and working on the assignment, but also -- and this is especially important -- in introducing it. This form of NIRS instills such qualities.

There is also such a progressive form as the introduction of scientific achievements of the department into the diploma projects of the students. Say that in the machine building department a student designs a new precision machine tool. The modern demand on such a machine tool is that it should have no vibrations since their amplitude is commensurable with the precision of the work. In our department we are working on methods of protecting against vibrations. So the student must introduce these methods into his design. That is, in the final analysis an engineer is trained in such a way that he has a constant drive and the ability to utilize the achievements of science in his daily work. He will also be a researcher.

#### "Like Master, Like Man"

It is well known that the teacher plays a very important role in developing creative capabilities in youth. We encounter great difficulties here since up to this point it is practically impossible to provide the higher school with a sufficient number of talented teachers who can approach the students individually and instill independent thinking in them.

M. A. Lavrent'yev was very involved in the problem of "who teaches." As an eminent mathematician, he was especially interested in those in charge of mathematics departments. He said that the departments should be headed by well-known scientists.

In my opinion, any teacher goes through several stages of awareness of the material that is being taught.

First, he studies the subject, understands it and begins to present it.

Second, he solves any (I emphasize, any) problem which is needed to illustrate the course and which can be used to teach students to solve similar problems. Moreover, he begins to formulate new problems which correspond more to the specialties of the students to whom he is giving lectures. Incidentally, this can be done only by someone who has a fairly strong grasp of the subject.

Third, the teacher studies all the known text books in his discipline, returns to the essays of the founders of the given science, and selects from all sources the best approaches and devices. Here, while adhering to the program given above, he should display an ability to present the material better than it is presented in the text books and in the program.

Fourth, the teacher begins to solve scientific or technical problems that have been set for the science he is teaching. This stage is exceptionally important. One can boldly assert that a teacher who during his entire life has never added the slightest thing to the subject he is teaching will hardly be able to awaken in youth a desire to create. Many leading scientists cannot

imagine a teacher in the higher school who does not do scientific work, or a scientist who does not teach. Thus A. M. Lavrent'yev added those who teach in the MFTI and NGU are the scientists who, as he put it, "are making today's science with their own hands." A similar demand, although to a different degree, should be placed on each teacher in today's VUZ. If one has in mind all VUZes (especially branch VUZes), this goal is still difficult to achieve. But it should be achieved, if only in the main areas of each higher educational institution. Even one or two research scientists working in the given VUZ can bring about a rebirth.

Sixth, the teacher should ascend philosophically to generalizations and to a determination of the position of his science among others. Without a philosophical approach it is impossible to write a real problem-solving lecture, to find the correct logic for presenting material, and to make the course unified. One must say that outstanding teachers and scientists have always been distinguished by philosophical interpretation of what they have learned.

In conclusion I should like to emphasize that higher education gives us the legal and moral right only to begin to carry out the duties of the engineer. But it will quickly fade away if a person is not continuously involved in its enrichment. In my opinion, the very phrase "completed higher education" is absurd. Education is becoming just as much of a fact of life as productive labor is.

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## ACADEMICIAN ADVOCATES MORE PRACTICAL PROFESSIONAL TRAINING

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 140-142

[Excerpt from work by A. N. Krylov, "Vospominaniya i ocherki" [Reminiscences and Essays], Moscow, Izd-vo AN SSSR, 1956, pp 622-624: "On Training of Specialists"]

[Text] Of course we all know Leskov's story "About the steel flea and the southpaw from Tula," and you recall how the ataman Platov sent to the ship a barrel of "English bitter" with the inscription: "Do not drink too much, do not drink too little, but drink in moderation"; and so I shall say: "Do not study too much, do not study too little, but study in moderation." Another writer, the triune Koz'ma Prutkov, incidentally, recited two aphorisms: "One cannot grasp the ungraspable" and "A specialist is like flux; his fullness is always one-sided." Finally, the famous M. I. Dragomirov, who was a "teacher of the Russian Army" for a long time, said: "Teach by example, and not by discussion."

The professors and instructors in VTUZes have the responsibility of teaching and training engineers, and not student engineers, but fully trained engineers, who could be sent directly from school to any plant or design bureau in the appropriate independent position.

Is this possible? I shall say it straight out: No, for this contradicts the aphorism of Koz'ma Prutkov and is tantamount to a desire to "grasp the ungraspable." No school can produce a completely prepared engineer, a shop manager or an independent designer, but it must provide the basic knowledge, principles and skills, and in addition to knowledge, the school must also provide the ability to apply this knowledge in practice. Then the plant practice itself will be that school which continues throughout the course of the engineer's life, in which he does not fall into routine, but improves each year and becomes an engineer who is a production manager or a true design innovator in his field.

People often object to this. Mendeleyev set the world on fire by himself, but after him it took tens of millions of Ivan Ivanovs to learn to take advantage of his discoveries and to utilize them better than Mendeleyev could. Newtons

and Mendeleyevs are born once in a century or maybe even more, a school does not create them, but millions of Ivanovs have been trained and are being trained by the "example" of Dragomirovs. And so it is time to recognize that no school can "grasp the ungraspable" or reach the "unreachable limit."

But in mathematics, a variable approaching its limit goes through an infinite number of partial values; and one does not always need the limit, but a couple of these partial values, which are also necessary for making a selection.

How and with what should this selection be justified? Usually in training this purpose is served by the "training plan" and the "program of courses" with their "special points." But it seems to me that here we frequently leave out the main thing: the student's ability to assimilate what is being taught and the nature of the activity to which he intends to devote himself in the future in keeping with this inclinations. This omission leads to large mistakes.

The training plans are based on programs. Each of them is drawn up by a professor who is in charge of the department and instructors in this department, that is, specialists in the given subject. They are always inclined to present the subject "in full volume," as if forgetting that they themselves during the course of their teaching activity may have been studying it for 15-25 years and more, and a student can devote to it only a small part of a year or semester, for at the same time he must study a number of other disciplines as well, which are equally necessary, and he must take tests and examinations in them.

Having taken such a test or examination, the student tries to "clear his head" as quickly as possible in order to take the examinations in the next subject, since the human ability to assimilate knowledge is not infinite, but limited.

It was said long ago that the goal of a university education is to "learn to learn." These words do not require a lot of explanation -- a simple comparison is enough. In olden times the Moscow merchants' wives always fattened geese for Christmas with soaked peas, and turkeys with cooked chestnuts. To do this the goose was sewn into a bag up to its neck, tied to the wall and stuffed with peas. They did the same thing with the turkeys. And they became fat enough for the merchants' taste and the merchants' bellies.

We frequently do something similar to students: we stuff them full of knowledge and information at lectures, but we do not leave them enough time to think, to assimilate and really to learn the subject.

One hundred years ago my father was in the 1st Cadet Corps. Each corps had a couple of sluggards or cadets who were incapable of learning, who from the very beginning decided that they would be sent as sub-ensigns to some garrison in Timbuktu. They had two methods of preparing for examinations. At that time they wrote with goose quills, and each student had his quill knife. So some began to prepare for examinations by sharpening their quills to a fine

point, and then went to the armoury where they soaked all the birch rods in tubs and cut off all the protruding twigs, so that the rods would be "smooth as velvet" and with this their preparations for examinations ended.

Others, who were more diligent and feared the "velvet" rods, prepared from abridged textbooks. This was done as follows: they tore off a third of the book from the front, a third from the back, and they learned the remaining middle by heart. If you answered anything at all on the examination they would not give you a zero and you would be spared the rod.

Judging from the volumes of certain programs and courses, the students of the Leningrad Shipbuilding Institute will have to turn to "abridged books"... It is necessary to tear off not a third from the front and a third from the back, but at least two-fifths from the front and two-fifths from the back, and then teach what remains in the middle.

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## ROUND TABLE DISCUSSION OF ECONOMISTS' ROLE IN INDUSTRY

Novosibirsk EKONOMIKA I ORGANIZATSIIA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 143-170

[Responses to article by I. I. Usacheva, "The Economic Services of the Enterprises and the Management Mechanism," EKO, 1983, No 1, materials prepared for publication by Ye. Lysaya and L. Shcherbakova: "Economists Should Influence Production More Actively"]

[Text] Continuing the discussion of the role of economic services of enterprises and associations in the modern stage of management, the editorial staff held a meeting of the "Round Table" in Moscow. Participating in it were managers, workers in economic services, and scientists:

M. M. Anisimov, candidate of economic sciences, docent, head of the department of methodology of planning in production associations of the Scientific Research Institute of Planning and Norm Setting [NIIPiN] of the USSR Gosplan, Moscow;

I. V. Budchenko, director of the plant for active control instruments (construction), Orsha;

A. I. Buzhinskiy, deputy general director for economics of the ZIL association, Moscow;

G. A. Yegiazaryan, doctor of economic sciences, professor, head of the department of economics of industry of Moscow State University;

V. G. Kryzhanovskiy, economist, Moscow;

G. S. Mergelov, doctor of economic sciences, chief of the financial administration of the USSR Ministry of Instrument Making, Automation Equipment and Control Systems, Moscow;

V. V. Novikov, candidate of economic sciences, chief of the planning and economics administration of the ZIL association, Moscow;

G. R. Pogosyan, candidate of economic sciences, head of the department of economics of labor of the Institute of the National Economy, Yerevan;

V. I. Radin, doctor of technical sciences, professor, head designer of the "Zavod imeni Vladimir Il'ich" production association, Moscow;

P. M. Stukolov, doctor of economic sciences, professor, chief of the main planning and economics administration of the USSR Ministry of the Electronics Industry, Moscow.

The discussion was led by the magazine's editor-in-chief, Academician A. G. Aganbegyan.

A. G. Aganbegyan: -- Our country is at a turning point in economic development. Conditions for management have changed radically. According to calculations, if all kinds of resources (capital, capital investments, raw material and labor force) were reduced to a unified measure, under the 9th Five-Year Plan this integrated indicator increased by 21 percent, under the 10th -- by 13 percent, according to the plan for the 11th Five-Year Plan it should increase by 8-9 percent, and under the 12th there will obviously be an even smaller increase. This reduction should be covered by increased effectiveness of public production. In this connection, the problem of intensification comes to the fore, and new tasks arise for all services of enterprises and organizations, primarily for economic ones.

The purpose of our meeting is to discuss the degree to which the condition of the economic services of enterprises and their structure, the skills of specialists and their work methods, and the conditions in which they find themselves correspond to the tasks set by the 26th CPSU Congress for changing the country's national economy over to the path of intensive development.

At the November (1982) and June (1983) Plenums of the CPSU Central Committee they emphasized the need to improve the entire sphere of management of the economy -- planning, administration, the economic mechanism. Production associations and enterprises are the basis of the organizational structure of the national economy. It is precisely here that we carry out the main economic activity, and it is here that production values are created. Therefore the responsibility of their economic services is very great.

Today I should like to consider two most pressing problems in the work of the economic services of enterprises and associations, relating them as much as possible to questions of improving the economic mechanism. It is suggested that four groups of problems be considered at the "round table."

First: what role should be assigned to the economic aspect of the work of enterprises not only now, but in the future, and what are the tasks of the economic services in light of the decisions of the 26th Party Congress and the November (1982) and June (1983) Plenums of the CPSU Central Committee.

Second: the interaction between economic services and other services and subdivisions of the associations and enterprises, on the one hand, and with the branch, subbranch and local agencies, on the other.

Third: the structure of economic services and their position. From your standpoint, what should these services be in order to carry out their tasks?

Fourth: the skills, payment and nature of the labor of workers of the economic services.

We can also discuss other questions which, in your opinion, exert an influence on the role and position of the economic service in solving problems related to increasing the effectiveness of production.

Analysis and the Future -- These Are the Main Things!

A. I. Buzhinskiy: -- The main task of the economic services, in addition to providing for normal current production and economic activity -- planning, accounting and control -- is to analyze and reveal resources and develop plans for the future. The possibilities of carrying out these responsible tasks depend on the role assigned to them at the enterprise or association, primarily by the director. The service cannot function successfully without the proper attitude and support from the primary production manager. Of course the attitudes of the Gosplan, other institutions, the party committee of the association, and local party agencies are also important. But the degree to which the director relies upon his economic service, the position he assigns to it in the system of management of production, plays the decisive role.

V. G. Kryzhanovskiy: -- During my time as deputy director for economics there have been three top managers. They have been equal in terms of psychology, temperament and erudition. I have had occasion to be an adviser, a consultant, a methodologist and, of course, an immediate assistant to the director. One cannot but note that the complexity of the work of the top manager of an enterprises increases each year and each day. Because of this he has less and less of an opportunity to deal with economic problems himself, and the head economist must make more and more decisions. In any event it is more correct to call the manager of the economic services the deputy director for economics, because the title of head economist (that is, head specialist, head consultant, head methodologist) does not make the status of the position absolutely clear. The title "deputy director for economic questions" reflects clearly and concretely the authority and responsibility and also the position among other deputy directors.

G. S. Mergelov: -- It seems that in those cases where the director of an enterprise has gone through a good economic school and is an economist by education and work experience, the plant receives a more competent manager than it does when it is headed by an engineer. The enterprise has a head engineer, a head technologist and a head designer, but production administration is an economic category. Of course this does not mean that there are no strong managers among the directors who were previously engineers. But a manager with a technical education should mandatorily undergo training specifically in economics and administration.

In any case and at any enterprise, whether it be headed by an economist or an engineer, and 95 percent of the top managers are engineers, the top manager should master economic knowledge. Then he will be able to take advantage of the potential of the economic service to a greater degree.

G. R. Pogosyan: -- It is practically impossible, and also inexpedient, for the top manager to be an economist in all cases. He should be a person who has mastered the art of administration, is capable of creating a healthy psychological climate in the collective and at the same time has the necessary level of economic knowledge. The top manager could be both an engineer and an economist, but under the condition that future engineers acquire the necessary economic knowledge in the VUZes, and economists receive the necessary engineering knowledge.

The responsibility of the economic services of the enterprise is closely related to the problem of the responsibility for the fulfillment of directive decisions. In 1981 at the November Plenum of the CPSU Central Committee it was emphasized that interruptions in supply literally disorganize the work of many enterprises and construction sites. How are decisions directed toward improving material and technical supply being implemented? Even under the 8th Five-Year Plan it was recognized as necessary to carry out a gradual changeover to planned distribution of material resources through wholesale trade.

As before, requirements are not being met for the development of guaranteed all-around supply on the basis of agreements between the associations and USSR Gossnab agencies, and also the completion of the changeover to centralized delivery of products to the consumers from supply and sales bases of the USSR Gossnab. Today the existence of funds for material resources does not guarantee that they will actually be received. This is why thousands of "pushers" have to be sent out on the long road for materials and equipment that are in short supply. And we speak of autonomous financing!

Last year in SOTSIALISTICHESKAYA INDUSTRIYA I saw one killing figure which is apparently worthy of deep analysis: at the Cherepovets Metallurgical Plant alone during the year they sent out 10,000 "pushers"! Translate this into money, and figure out the diversion of people, resources and so forth. Of course, this is not "from the good life," but the result of an unbalanced plan. There is no place for economic analysis in situations like these!

I. V. Budchenko: -- Yes, when economists begin to coordinate the plan or to make adjustments, they are not able to deal with the future, and the role of the service deteriorates because of this. But I am an optimist and I believe in the future of the economic services, although they have not yet reached the level of the new tasks everywhere. Life and the economic situation that is taking form will make it necessary to increase their role.

#### The Service Should Be Comprehensive

M. M. Anisimov: -- The author of the article under consideration asks that we establish the structure and strengthen the role of the head economist.

Of course one can establish the status, but the role and authority of the economic service cannot be established by any decree. They take form as a result of the qualifications of the head economist himself and his assistants, their understanding of the problems of the enterprise and their ability to solve them. If you wish, it is the ability to arrange relations with people.

The article expresses dissatisfaction about instructions from above. It turns out that, on the one hand, we say: "Let us expand the independence of the enterprises," and on the other we request: "Let us establish what the economic service should be."

Usacheva writes that "arbitrary reorganization of the economic services is inadmissible." Actions should be thought out -- there is no doubt about this. But does this mean that the structure of the economic services should be the same and predetermined once and for all from above? It seems that this cannot be the case: the overall structure of the enterprise, and especially the structure of its services depend both on the size of the enterprise and on the peculiarities of technical equipment and production technology, as well as on many other factors.

EKO: -- Apparently there can be no unified standard structure, but it is necessary to determine the principles of the organization of economic services, which are dictated by the common tasks of improving economic work, and it is necessary to determine their status.

G. S. Mergelov: -- Yes, a certain standardization is not only possible, but is also necessary, say, within the framework of the branches.

How is this done in our branch? We have a standard structure of the administrative staff, including the economic services. The branch itself is specific and produces many products. From the production of large computer complexes to jewelry items.

Let us take the financial service. When our ministry was created we decided to see how the financial service was organized at the plants, and we found out that there was complete anarchy here. Financial subdivisions were created in some places, and in some places they were not. At some plants they were under the jurisdiction of the bookkeeping offices, and at others they were adjuncts of the planning divisions. Then, depending on the nature, volumes and scale of production, we broke the enterprises down into groups, having established that at some enterprises financial divisions are created, at others -- financial-sales, and at still others -- financial-bookkeeping, and financial groups were singled out in the last two. This helped to determine the role and position of the financial services and to raise the organizational and economic level of the control of finances.

I. V. Budchenko: -- Usacheva raises the question of eliminating the fragmentation and irregularity of economic services. Now at various enterprises, divisions of an organizational and economic profile are under the jurisdiction of various managers: in some cases the head economist is in charge of the planning and financial division, the economics laboratory, and the division for labor and wages. In other cases labor economics is in the block of social and personnel services and the financial division -- in sales services. The incomplete staffing of the economic services makes it difficult to organize economic work.

The unified economic policy at the enterprise should be conducted by the deputy director for economic problems. Questions of planning, accounting,

reporting and analysis are indispensable functions of the economic service. The effect from unified management of the divisions and services (planning-economic, labor and wages, scientific organization of labor, production and administration, financial, bookkeeping, ASUP, and legal) is undoubted. The deputy director for economic questions is not an adviser; he is a person who is responsible for fulfilling planned assignments, and not only for informing the performers of these assignments. Moreover, he is not relieved of the responsibility for coordinating technical and economic indicators of the work of all services and divisions of the enterprise. The deputy director plays the role of the final arbiter here. He should be given the right to sign all reports to the Central Statistical Administration and higher agencies.

The deputy director, being responsible for the economic condition of the enterprise, must call to account any worker who has caused material harm, be it underfulfillment of planning assignments, idle time of equipment, above-normative supplies of materials and equipment or overexpenditure of fuel and energy resources.

A. I. Buzhinskiy: -- At ZIL the block of economic services, which is under the jurisdiction of the deputy general director for economics, is formed in the following way. It includes the divisions for planning and economics, labor and wages, ASU, contractual and legal issues, the head bookkeeping office, and the financial administration. It is basically the same structure as at the VAZ. Apparently, it is in keeping with today's tasks of the service. But our association has its peculiarities -- economic units in the technical services. Structurally, they are located there, but in practice they operate under my leadership. The bureau of technical and economic calculations, which does all calculations regarding new technical equipment and technology, is in the division for preparation of production, but functionally it is under the jurisdiction of the deputy director for economics, that is, me. The division for norm setting for labor at ZIL is included not in the administration for labor and wages, but in the technological administration. Nonetheless, it is part of the economic service and functionally it is also under my jurisdiction. There is a unit for calculations of the economic effectiveness of new products in the head designer's administration. There is a group of workers which does economic calculations in the planning administration. They too work under my leadership. When establishing this structure we had the goal that all technical developments carried out in the technical services would be subject to calculations on the basis of unified methodological principles which have been accepted in the association. The creation of economic units there is a method which makes it possible to develop a taste for economics.

Our position is this: economic work should be well arranged precisely in the technical services, on which the association's new products and production future depend. We have managed to achieve a certain amount. If only that no change in design or technology will be introduced without a preliminary calculation of the production outlays and without the approval of the economic service. This is a certain kind of economic discipline, the education of technical services in the spirit of increasing the effectiveness of their actual work.

Unfortunately, at the enterprises the technical services, which essentially contain the foundations of their economy, frequently do not have adequate contacts with economists. In our association we have managed to introduce what I was discussing at the head plant and in several branches. But in certain enterprises the interrelations among the services are not developing as we would like them to. But we are working on improving the cooperation.

Economic services should not act as inspection teams or controllers. Their task is to participate directly in the acceleration of scientific and technical progress and improvement of product quality, and thus to influence these processes so that production outlays are reduced.

New technical equipment is still not advantageous in all cases. This was discussed at the November (1982) Plenum of the CPSU Central Committee. Sometimes it is necessary to agree to an increase in expenditures, but it is important for this to be done deliberately, so that in these cases it is possible to see the national economic effect and the effect for the consumer.

In my opinion, the influence of the economic services on technical progress is one of the principal problems of their work. Yet at many enterprises -- whether they make changes in designs or introduce large organizational and technical measures -- the economic services simply register this. I consider this situation to be inadmissible. In the final analysis this decides the authority and role of the economic services at the enterprises. The economic service should be comprehensive and should influence all aspects of the activity of the association.

#### Where Are the Sources of the Flood of Paperwork!?

V. G. Kryzhanovskiy: -- The organizational structure of production associations was considered when they were created. As a rule, people discussed the fact that the administrative staff of the association should be more effective and have fewer personnel, and only in extreme cases should it be equal to the total number of workers of the staffs of the plants included in the association. Certain functions were added for the associations, which the plants did not have. And the administrative staff of the higher organizations did not decrease, although the volume of its work did. All-union industrial associations and functional administrations of the ministries, because of the reduced volume of routine work and the number of organizations directly under their jurisdiction, had a greater opportunity to engage in analytical activity. They began to demand more organizational and economic information, and to ask for new materials and explanations on the basis of it. Thus the flow of paper began to grow, and quite significantly.

V. V. Novikov: -- I do not wish to complain too much about how overloaded the economic services are or about how tired we are, but still it is necessary to show the volumes of information that have to be processed. Here are some figures.

The socio-economic part of the ZIL plan (only for the three main sections of production) includes 7 forms, 20 unfolded pages, 146 columns and 246 lines. The section for labor includes 18 forms, 37 pages, 163 columns and 427 lines.

If one multiplies the columns by the lines, the figures are immense. The section for production cost: 22 forms, 59 pages, 264 columns and 869 lines. Without being involved in this work it is difficult to imagine how great the volume of calculations is. We took the technical and industrial financial plans for 1960 and 1982. In terms of weight, the latter is four times as heavy as the former, and in terms of the labor-intensiveness of drawing it up, according to our calculations, there was a four-fold increase.

Of course, all economic ties have become more complicated. Production associations are larger now. It is understandable that our departmental and planning agencies want to know as much as possible and to receive the maximum amount of information. But I can say with confidence that a considerable part even of the earth-shaking sections of the plan remain in the reserve, and only the consolidated leading forms are used. But we must fill out and submit everything.

We have learned to consider the labor of the worker, and we know how to evaluate the labor of the designer. But nobody thinks about the labor-intensiveness of the work of the economist. There exists only one word: "necessary." It is necessary to do it.

It is not enough that the number of official statistical forms is increasing. There are also forms that are being introduced without the agreement of the Central Statistical Administration, for example, forms for accounting for product quality for Moscow organizations.

Since 1982 we have had to give information about environmental protection each quarter. And the initial report is not considered. The problem is set for us thus: "Other enterprises have submitted a report and so you must submit one." I think that the "others" are convinced by a similar means. The same thing can be said about the report on corrosion. An immense amount of labor, and there is no primary accountability. It is necessary to look at the corrosion of metal in production and in construction ...

We must provide reports regarding Komsomol youth collectives, taking into account the fulfillment of personal production plans by each worker. This information must be gathered. With the creation of the computer center, our ministry introduced special accounts. But their forms do not correspond to those of the computer centers of the associations. Frequently we must transcribe information by hand from one form to another, and then to submit it to the ministry.

Upon receiving the EKO invitation to participate in the "round table" meeting, we in the planning and economics administration discussed what I should say. The specialists asked me to express their common view that before demanding any economic information one should think about how it is to be acquired ...

It seems to us that in recent years there has been a flow of methodological materials that have not been tested in practice. The USSR Gosplan, the Ministry of Finance, the Central Statistical Administration and the branch ministries, before introducing one form or another, new methods or new indicators, should test them experimentally at base enterprises.

It has now become fashionable to criticize the normative net output. But it is not a matter of fashion. There are instructions from the USSR Gosplan and the Central Statistical Administration of 11 November 1981 to the effect that when the level of cooperation is changed the net output normatives should be revised. As though everything were fair. But what is the scope of them? During 1981-1982 in our association there were 40 of these changes and they entailed the revision of 4,000 normatives of the 11,000 net output normatives that were established! They are now looking for a compromise solution. But under the conditions of mass flowline production, in any case it will be necessary to do a gigantic amount of work to account for all the changes.

G. A. Yegiazaryan: -- I too would like to say a couple of words about the normative net output. The stimulating role of the normative net output consists in that it provides for a dependency between the final result of the operation of the enterprise and the wage fund. The normative net output is the basis for determining both the wage normative and the normative of labor productivity -- the most important fund-forming indicator.

But how does the system stimulate increased production effectiveness when the normative net output is included in it? The figures for the past 2 years make it possible to draw the following conclusion: there has been a significant structural change, and the proportion of the normative net output, calculated in wholesale prices, has increased. This means that on the whole there has been an increase in the proportion of the more labor-intensive (less material-intensive) products. This change is the main result of the application of the normative net output.

Now let us look at how it influences the increase in the final results, and effectiveness. On the one hand, it reflects fuller satisfaction of needs of the national economy for certain kinds of products and a savings on material resources. On the other, it is accompanied by an underfulfillment of the plans for the delivery of a number of kinds of less labor-intensive products and an overfulfillment for the more labor-intensive products.

There is also a tendency toward artificially increasing the labor-intensiveness for individual kinds of items. The "degree of freedom" of enterprises to form the normative net output is fairly great, and including it in the system of incentives creates a certain motivation in one direction. In this connection it seems expedient to revise the role and position of the normative net output, and also the value indicators of volume generally, in the system of management.

There is some point, in the first place, instead of having two volume indicators -- normative net output and volume of products sold (taking into account the fulfillment of the delivery plan) -- to plan only the latter centrally. Then it would be necessary to change the system for the formation of incentive funds. The main fund forming indicator should be the indicator of sales volume, taking into account the fulfillment of the plan for deliveries. For more efficient utilization of resources and improvement of product quality, one should introduce a system of direct deductions from the savings on individual kinds of resources: from savings on the wage fund (calculated taking into account the reduction of the actual number of

personnel as compared to the limit number); from savings obtained as a result of reducing material expenditures as compared to the established limit, which is envisioned by the decree of 30 June 1981; from savings on payments for capital; and from incentive increments to the wholesale prices.

In this system, increased labor productivity is stimulated through reducing the number of personnel and increasing the production of products of the highest quality category -- through the incentive increment. Thus the normative net output is "drawn out" of the system of fund formation. And one stimulates the most important factors in increased effectiveness, which is achieved through direct deductions from savings on all kinds of resources. It is determined on the basis of centrally planned limit indicators and long-term normatives.

A. I. Buzhinskiy: -- Before introducing this indicator it is necessary to see what it will provide for mass flowline production. In our opinion, the normative net output, what with the permanently established flowline production, will produce nothing but additional work. And we will be required to fill out forms not only for the normative net output, but also for the commercial output and sales. The matter has become so complicated that, in addition to our intrafirm cost accounting, we now calculate the production volume in five prices.

EKO: -- Which?

A. I. Buzhinskiy: -- Wholesale, retail, normative net output for the association, normative net output for the shop and planning-calculation prices within the subdivisions. In 1982 we also took into account the 1981 price. It is good that ZIL has a strong computer center and it enabled us to cope with the tasks.

But what good are planning deadlines? In December 1982 we had not yet received a plan approved by the ministry for our association for 1983, but we already had an order according to which we were to inform all the branches of the plan within a week's time! We had the directives, but we had no plan ... The ministries send letters suggesting that we adopt a counterplan, but there is no five-year plan that is translated into the new prices. In comparison to what should we adopt a counterplan?..

P. M. Stukolov: -- Our branch has the same problems. I must say that the ministry adds for its operations work perhaps only 2 percent of certain indicators. But all of them are predetermined by the existing economic mechanism.

The economists themselves are guilty of some things. I am convinced that the Gosplan does not develop indicators. It transfers this work to its economics institutes, for example, the Scientific Research Institute of Planning and Normatives (NIIPiN). The institute sends them to the system of ministries, and they send them to their branch institutes. And there they begin to take into account the "specifics." And then they return along the same chain. The NIIPiN is left with nothing to do except to figure out how to fold the pages. And therefore the technical and industrial financial plan for 1980 is one-fourth as heavy as the technical and industrial financial plan for 1982.

Now a second aspect. As we know, the process of division of labor in production proceeds along the horizontal. New productions and new branches are constantly being created, and the number of functional committees increases as well. In addition to the USSR Gosplan, forms are created by the Ministry of Finance, the Gosnab, the State Committee for Labor and Wages and the State Committee for Science and Technology. There are forms for the control system and for the effectiveness of the ASU. When filling them out you must write down the effect you receive as a result of improvement of the organizational structure, and which is the result of improvement of methods of control and improvement of the operation of computer equipment. There is also a report on scientific organization of labor, the distribution and cooperation of labor, the introduction of advanced devices and methods of labor, and so forth.

The majority of forms and indicators duplicate one another, but in a number of cases they are contradictory. But they must be filled out. We report on the conventional effect, and in response we receive an assignment for reducing production cost, which must be carried out in reality.

We also compile reports on the assimilation of capital investments, which are requested of the client ministries, but they are compiled not by these ministries but by the contractors who are not under the jurisdiction of these ministries and are included in a different system of organizations. All these taken together creates a mass of indicators. We compile about 175 reports in our associations and in the ministry. Judge for yourself how much time is left for analysis and determination of the prospects for development...

V. G. Kryzhanovskiy: -- Local agencies which request information on forms of their own invention contribute to increasing the paper landslide. For example, we present them with the passport of the enterprise each quarter. We do not understand how they can request this of us, but they request it, and we give it to them. We use another form to submit the passport to the ministry. This takes a catastrophic amount of time.

M. M. Anisimov: -- I would not like to give the impression that I denigrate the role of the economic services. After completing the institute I myself took this path, and I have a great deal of respect for the economic services. I agree with Aleksandr Ivanovich Buzhinskiy that economists should work on the development of production. But in fact in the majority of cases they do not work on these problems. It seems to economists that they control the economy. But what kind of control is this when all they do is count forms and refine indicators? The economic services should not be reproached or blamed for this, for it is rather a problem of theirs. They have been flooded by reports. And many economists have reconciled themselves to this. They complain to one another and bow before their destiny, but they frequently think that it cannot be any other way. Everyone is a little bit guilty of this. The least guilty are the enterprises, but they too are guilty. All-union associations have participated actively in this growth of the quantity of forms, and so have the ministries and departments. There are forms which can be filled out intelligently only when one is drunk, and it is impossible to do when in a sober condition. But it has turned out that it is also impossible to eliminate them! Behind each form and each indicator there is

some higher organization. And if one raises the question of eliminating them, it is necessary to raise the question of reducing the staff. But it is necessary to eliminate these forms.

V. I. Radin: -- I stand out like a sore thumb among you, since you are all economists and I am a head designer. Allow me to make a couple of remarks from the outside, as it were.

I have been working at the Plant imeni Vladimir Il'ich for 33 years. During this time our economic service has at least doubled in size, but it seems to me that the efficiency factor has decreased. The number of people in it is always increasing, but the rates of increase in labor productivity -- are dropping ...

As the head designer of all asynchronous electric engines, I am involved with 28 plants of our branch. I have occasion to observe what the economic services are engaged in. Just as at the ZIL, they fill out an immense number of forms. The head economists are concerned mainly about adjustments to the plan. It is hard to expect effectiveness from this kind of work. Incidentally, the ZIL cannot boast of up-to-date products, in spite of its powerful economic service. There are many other enterprises and associations that cannot boast of this either.

The same thing applies to our electrical equipment industry. We designers do not see any influence from the economic services on the process of the introduction of new technical equipment, which is now the main thing for us. Are the economic services to blame for this? I wish to repeat: this is their problem and not their fault.

#### The Enterprise: Rights and Responsibilities

EKO: -- Vladimir Isaakovich, from your viewpoint, what is the reason for the insufficiently effective work of the economic services? How can their influence on production be increased?

V. I. Radin: -- When I read Usacheva's article I thought that it is not a matter of structure -- as has already been correctly pointed out, structures can vary. It is a matter of the content of the work itself. It seems to me that the main thing is to grant greater economic independence to the enterprise and the association. For under present conditions the head economist can do very little. He is restricted to the rigid framework of outdated provisions, he must observe the rules for wages which were established many years ago, he must provide information that nobody needs, and so forth.

I wish to discuss one fact from the standpoint of my fresh impression. According to our developments, the Elektromashina Plant in Ulan-Ude is producing products. The plan for the 11th Five-Year Plan included the construction of a smelting shop at the enterprise at a cost of 12 million rubles. We have created a new design for an asynchronous engine which includes little cast metal, and as a result, under the current five-year plan we need not 12 million but 3 million rubles for the development of the plant. "It is

necessary to build in such a way ...." Only later did I understand how naive this sounded. Everything turned out to be much more complicated. Along with the plant director, we visited the Stroybank, Gosstroy and Gosplan. It was necessary to convince people that a shop costing 3 million rubles was more advantageous than one which cost 12 million ... The director remained in Moscow for months in order to get something accomplished: to change the title lists for construction, to coordinate it with the Gosbank, and to obtain the "OK" from the Stroybank ...

Therefore it seems to me that in stating the problem of economic work and the role of the economic services at enterprises, the emphasis should be shifted in the direction of improving the entire economic mechanism and granting greater rights to enterprises, associations and ministries. Of great importance is an experiment which will be conducted beginning 1 January 1984, by a decree of the CPSU Central Committee and the USSR Council of Ministers in a number of ministries, including ours and the Ministry of the Electrical Equipment Industry, for expanding the rights of production associations and increasing their responsibility for the results of their work.

V. G. Kryzhanovskiy: -- How does one observe the rights of the production association, expand them and give the association the opportunity to act independently -- these questions have long been pressing. Take the distasteful conversation about the establishment of prices. The time periods for the movement of documents from the establishment of the prices until they are finally approved, after which they appear on the price lists are immense. There is the provision that by the time the initial batch of new technical equipment is put into series production there should be a draft of the price list. But it takes 6 months to a year to coordinate the technical specifications and to obtain permits from various levels of organizations. In order for the new products not to lie around, one must involuntarily violate the provision and produce the product with the inscription "experimental production" or take advantage of the right to coordinate prices with the client, although we are obligated to have a price list and to work according to its prices.

Today the production association is frequently the "king without any clothes." It does not have the right to create reserves. If the wage fund for some enterprise that is included in the production association is short by 1,000 rubles, even though we are given hundreds of thousands of rubles according to the plan, we cannot solve the problem of these thousand rubles ourselves.

G. S. Mergelov: -- What are the reasons for the difficulties associated with the organization of control of production and economic work? It seems to me that they lie in the extreme complication of the economic mechanism. Let us just take the last three and a half years. More than 100 normative documents were published to elaborate on the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979. And out of these grew additional instructions, provisions and changes. And here are thousands of pages of text which, it would seem, primarily economists are obligated to know.

I daresay that today there is not a single economist, even the most qualified, even with a great deal of experience who devotes himself fully to this cause, who will know all of this. It is impossible to remember all the instructions. One can know and remember only their basic directions.

Take, for example, such a responsible matter as the deduction of incentive funds. Today it is necessary to do not dozens, but hundreds of operations in order to calculate the funds correctly. And the process is not getting simpler but is becoming more complicated as more and more new guidelines are published. And this matter is based on living people and immense responsibility for the expenditure of state funds.

I think that it is related to the common problem of limiting the rights of the manager of the enterprise. He is told how to do everything -- how to move his left leg, and how to move his right...

M. M. Anisimov: -- And yet the decrees repeatedly raise the question of strengthening the economic independence of the enterprises. Take, for example, the decree of 12 July 1979. It raises the question of the development of the economic initiative of the labor collectives and expansion of the rights of production associations (enterprises). But after this, the enterprises are given 25 indicators in excess of the assignment. This practically regulates all of their production and economic activity. What products to produce, how many and what kind of materials to expend for this, what quantity of these materials to save, how many workers to maintain, how much to pay them, and so forth. And, in addition to these indicators that are set from above, there is also economic legislation which spells out everything that can be spelled out. There is the right of party and soviet agencies to control the administrative and management activity of the enterprises. There is the right of various supervisory agencies to control. Because of this control the enterprise cannot deviate significantly from the correct course. Under modern conditions, when the scale of the economy has grown, there are greater requirements on the quality of the products that are produced, and expansion of the economic independence of the enterprises is becoming more and more expedient. The economic experiment earmarked to begin on 1 January 1984 should provide an answer to the question of which path to take to expand the rights of the enterprises.

G. S. Mergelov: -- Rigid regulation leads to an increased number of indicators. But it is not only a matter of this. If we return to the decree of 12 July 1979, it earmarked much that is useful, but much is also being realized slowly in practice. When analyzing the methodological and instructive materials published by planning and financial agencies to elaborate on this important decree, one involuntarily gets the impression the the planning agencies are constructing the economic mechanism for themselves. The fact is that many points of the original document, directed, for example, toward expanding the autonomous financing rights of the enterprises, are hemmed in by a fence of unjustified restrictions. And this in spite of the fact that the decree itself emphasizes the need to develop democratic foundations in control of production.

P. M. Stukolov: -- In implementing the decree we have made the most progress in the introduction of the normative net output. As for continuous planning, we are only discussing this.

EKO: -- As was noted at the November and July Plenums of the CPSU Central Committee, a restructuring of the system of planning and control of production and the entire economic mechanism is one of the crucial tasks. I should like to hear your suggestions.

V. G. Kryzhanovskiy: -- If the principle of continuity of planning were to be applied in practice, the numerous adjustments to the plan which take so much of the economists' time would disappear. More effort is expended on adjustments than on drawing up the plans themselves.

M. M. Anisimov: -- The need to increase the role of production associations in planning is obvious today. The strengthening of this role should proceed in two directions: reduction of the number of assignments set from above (control figures) and restructuring of the very process of planning, ascribing to it the nature of a creative search for the most effective directions of development. As for restructuring the planning process in production associations, we see our task to be the following.

At the present time we develop the draft of the standard methods for drawing up the five-year plan for the production association. Its main reference is this: the five-year plan is developed in two stages -- suggestions for the draft of the plan and the draft of the plan.

In the stage of "suggestions for the draft of the plan" there is a selection and a substantiation with engineering and economic calculations of the most effective direction for the technical and economic development of the collective of the enterprise. In this stage control figures are not sent down "from above." The collective of the enterprise develops its variant of the technical and economic development, based on its own calculations of its capabilities and the development of these capabilities in the planning period. This lays the engineering and technical base for the second stage of the plan, will enable the management to defend "its" plan in the branch, and will give the branch a reliable information base for developing the branch plan.

The second stage of the plan remains basically the same as it is now, but there are plans to reduce sharply the set of forms and the number of indicators. There are complaints from all sides about the present methods, which include too many forms. The criticism is just, but we need help: the composition of the forms and indicators should be preliminarily "smoothed out" at two or three enterprises, and I would like to take this occasion to suggest that the ZIL workers do this.

A. I. Buzhinskiy: -- Of course.

M. M. Anisimov: -- We shall just write that in the "round table" minutes. You laugh, but it is definitely not funny. I asked for your help in a letter, and you did not answer.

V. V. Novikov: -- It would have taken an entire volume to answer. A great many requests come in ...

G. S. Mergelov: -- The demands on the production manager are increasing, but far from always are the director and his assistants capable of making the decision which is necessary in the interests of the matter. There should be conditions whereby the manager can make the decision that is most useful for production. Frequently the framework of unjustifiably rigid regulations force managers of enterprises to use various stratagems which verge on violations of the law.

#### The Qualifications of a Specialist: On What Do They Depend?

EKO: -- The time has come to speak about economists and their professional level -- do they correspond to the tasks that are being set for economic services?

V. G. Kryzhanovskiy: -- A good deal has been said here about the difficulties of the work of the economic services. It is complicated, and this creates another problem: there are fewer and fewer who wish to enter the management of the economic service. The load is too great -- moral, psychological and physical. It is much more peaceful to be, say, the head of a bureau than the head of a division. From the standpoint of wages the difference is not so great, and the work is much easier: the section of work is already there, and there is less responsibility.

A. I. Buzhinskiy: -- The majority of economists, because of this heavy load, are dealing less and less with their main task -- analysis and processing of suggestions. And this is one of the main reasons why the qualifications of the workers of the economic service are decreasing, and their growth as specialists is retarded.

P. M. Stukolov: -- I am confident that you could not find an economist who would agree to occupy the post of a head engineer. He would be considered a schemer. But still people without an economic education can be appointed to the post of head economist. All this comes from a lack of understanding of the role and significance of economic work on the part of certain management workers.

Our profession has become mainly female. The average professional level of economists is dropping because women cannot devote as much time to their work as men can: they have a home and family on their shoulders ...

G. S. Mergelov: -- Yes, one must speak about "devaluation" of personnel. And I would mention the bookkeepers first. What with the constant reduction of the administrative and management staff they have an especially bad time. They did not pay attention to their wage level at one time, and now the occupation has lost its prestige. As a result, this service has undeservedly lost status. There are almost no die-hard bookkeepers left at the plants. I think that this is one of the reasons for the increased possibilities of thefts, machinations and distorted reports.

A. I. Buzhinskiy: -- Yes, nowadays it is a problem to find a good bookkeeper. For example, we could not find a good bookkeeper in Moscow. The methodology of bookkeeping is not being improved, and it lags behind the requirements of life. These difficulties are becoming problems of statewide significance.

G. R. Pogosyan: -- The situation with economists of other profiles is not much better. In Armenia, for example, we have 4,000 workers in divisions of labor and wages. Among them are professional economists, practical workers with a secondary and secondary-technical education, and also people who were "adapted," who have no idea of economics -- philologists, historians (there is an especially large number of them in divisions for scientific organization of labor, and they are developing new systems for labor organization!).

Brigade organization is now becoming widespread. People who have no idea of what it is are "introducing" it at enterprises. The shortage of skilled specialists in economics and organization of labor is being felt sharply in Armenia. It will take the VUZ system dozens of years to solve this problem. Therefore, on the initiative of our department under the Yerevan Communist Party Gorkom and the Armenian Council of Trade Unions, we created a public training institute for norm setting for labor, and it has been in operation for four years now. Here workers of the OOTiZ who do not have an economic education can increase their qualifications and be retrained. More than 300 specialists have already received diplomas upon completing this institute.

G. S. Mergelov: -- There are many other organizational problems on which the prestige of the plant economic services depends. Take this paradoxical case. Several years ago we tried to find out: why are planning services included with engineering and technical personnel, and financial services -- with employees? Nobody could answer this question -- neither the Ministry of Finance nor the Central Statistical Administration, although this distinction is made on instructions from the Central Statistical Administration. But what is behind it? Certain material goods which workers of financial subdivisions cannot have.

A. I. Buzhinskiy: -- It is now permitted to give employees personal salaries. But this does not pertain to pensions ...

I. V. Budchenko: -- I should like to note another aspect: our old economists have not mastered economic-mathematical methods and cannot work with electronic computers which, of course, is not in keeping with the requirements of the day. And our task is to teach them. VUZ graduates who come to the plant are better trained in this respect.

V. G. Kryzhanovskiy: -- I cannot agree with you. Possibly graduates of economic VUZes know economic-mathematical methods better, but they have a poor knowledge of the nature of the practical work of the economist (I emphasize -- nature).

What kind of economist can be considered qualified? Probably the one who has mastered a broad work front and has a profound professional knowledge of many of its areas. Young specialists when they come to the enterprise quickly

master one fairly narrow area, replacing veterans there. After this they think that they have the right to be managers. The VUZ does not instill in them the conviction that the manager must know well the work of all the workers directly under his jurisdiction.

A. I. Buzhinskiy: -- Undoubtedly, the level of training of graduates of economic VUZes has risen somewhat in recent years. But it still does not meet the requirements of the enterprise. They actually have a poor knowledge of concrete economics. Incidentally, this problem pertains to graduates not only of economics departments, but also of engineering departments.

In order to "smooth out" the unevenness in VUZ training, at ZIL we have created an economics department at the plant-VTUZ. We have introduced a course for organization of the economic work of the enterprise. People with a higher technical education also study in the VTUZ. The course of training for them is a little more than 3 years. After completing it they acquire the specialty of engineer-economist. Half of our shop and administration chiefs and many youth have gone through this system. This is our reserve for promotion.

P. M. Stukolov: -- Any young specialist who comes into production "floats" for the first couple of years -- including the technologist and the designer. But, as a rule, the mistakes of the economist cost the enterprise more. The economist must combine the experience of an organizer, the understanding of a technician and the ability to analyze. These important qualities cannot be developed immediately. The corresponding retraining is necessary. Therefore it seems to me that the system that exists at ZIL is worthy of the most widespread dissemination.

A. G. Aganbegyan: -- What conclusions are we coming to? The role of the economic services should be increased. Of course the success of their work depends to a decisive degree on improvement of the economic mechanism. The significance of the plant economist can actually be revealed only when the enterprise really receives economic independence. Recall the times of the economic reform of 1965 when managers and engineering and technical personnel turned their backs to economic indicators and began to struggle for higher profitability of production. And how the importance of the economists increased at that time!

And now large associations are increasingly becoming the main autonomously financed units in our economy. They have greater possibilities than simple enterprises do of utilizing resources, accelerating scientific and technical progress and solving social problems. So their independence and responsibility can be expanded, in my opinion, to a much greater extent than was the case with respect to enterprises in 1965. And the tasks of the country's economic and social development are now different, and more reliance is placed on intensification and the changeover of the economy in the direction of improving the well-being of the people.

Under these conditions the tasks of the economic services are also complicated a great deal. The November Plenum of the CPSU Central Committee in 1982 noted

that it is necessary to study the experience of the sister countries and the leading enterprises and organizations of our country. And a good deal in their work depends on economists. At the present time at certain enterprises the economic services are not sufficiently directed toward the future, and many have become bogged down in current affairs, reports and the filling out of numerous forms. The main thing is to provide purposefulness in the work of economists and to subordinate their work to the demands of increasing production efficiency and defending nationwide interests. Here it is also legitimate to raise the question of the director's attitude toward the economic service. Sometimes the managers do not know exactly what the economic services do or whom they consist of. It is also bad that the work of these services is not coordinated in the branches or in the economy as a whole.

But still I think that you will agree with me when I say that in associations where the manager of the economic service presents the issues broadly, its role ad authority are significant. Here it is sufficient to refer to the VAZ experience. It was necessary to generalize the advanced practice of the economic services, and to develop particular principles for their functioning and standard structures and methodological guidelines. It is very good that the Gosplan has created in its scientific research institute a division of methodology of planning in production and scientific-production associations. We shall await the results of its activity.

Many other interesting questions were raised in the discussion. In particular, about the programs of economic VUZes and departments, and about the payment for the labor of economic and financial workers. We hope that interested departments will respond to them.

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## INSTITUTE ECONOMIST RESPONDS TO ARTICLE, QUESTIONS ROLE

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in  
Russian No 11, Nov 83 pp 170-177

[Article by G. V. Grenbek, candidate of economic sciences, Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk): "Economic Services of the Enterprise or Services of the Head Economist?"]

[Text] As we can see, the discussion of this burning issue which was initiated by I. I. Usacheva's article is attracting the attention of many industrial workers. Naturally, the opinions expressed are mainly those of specialists, who are to the greatest degree and most directly interested in its resolution. This is good, since the discussion is concrete, and behind it one can see living people and truly informed opinions. But the interest of a specialist who burns with all his heart for his cause involuntarily gives rise to a one-sided approach. This is precisely what caused me to participate in the discussion.

It seems that it would be useful to clarify certain initial points: a purposive establishment of the work of the economic services and their position in the overall structure of the administration of the enterprise or production association.

Assertions that the importance and weightiness of economic decisions increase with the increased complexity of production and the need for its all-around intensification are quite correct. And I should like very much to think that this is the main reason for the increased volumes of work for plant economists in the past 10-15 years, that their efforts are directed primarily toward searching for the most effective variants of the solutions to the national economic problems that have been set for the collective.

But is that the case?

Unfortunately, the practice of the majority of industrial enterprises shows quite a different direction for economic services. They spend the lion's share of their time and effort on work that either has no effect at all or has a weak influence on the intensification of production. This is manifested most clearly of all in bookkeeping.

Economic analysis of the work according to the results of each month, quarter and year at one time comprised the core of the activity of the head bookkeeper and his direct assistants who were responsible for the main areas of production expenditures. The sanction of the head bookkeeper for one expenditure or another was most frequently given out of considerations like it is "necessary," "useful" or "advantageous" (under the condition, of course, that the given operation was legal). And at the enterprise the head bookkeeper was the head economist -- not in terms of his title, but in terms of the essence of his work. They say that such bookkeepers are now a rarity and that they should go down in the Red Book: if they have not all been transferred, they are gradually being transferred, the more so since their "environment" is changing drastically. Now the head bookkeeper signs or does not sign a document mainly on the basis of whether it is "permitted or not permitted," turning over in his memory a multitude of instruction, normative prescriptions and instructions from the latest inspection. Economic expedience has dropped into the background and is barely within the realm of his competence.

For a long time we have been conducting a questionnaire of management personnel of large industrial enterprises and production associations. We are clarifying the peculiarities of the administrative structure. The most widespread opinion about the significance of the bookkeeping services is -- "control over the observance of planning and financial discipline" or (a larger form) "providing for protection of socialist property" (plus "accountability"). There is no doubt that protection of the national wealth is an important matter, and the bookkeeper's role in this is not the smallest. But if this function were regarded everywhere as the main one, the basic one, or perhaps even the only one for the bookkeeper's office, would this not be a devaluation of the economic work of this section? It is no wonder that with the overall stable growth of the number of workers on the administrative staff in industry, the number of bookkeeping workers is decreasing relatively, and sometimes absolutely.

A number of factors lie at the basis of this process. It is appropriate to recall one, although it is not the main one. The emergence and development of planning has led to the appearance of the corresponding structural subdivisions. Planning, and then planning-economics division have taken their places, and in the economics of the enterprise, along with the head bookkeeper, there has appeared a "second master" -- the chief of the planning and economics division. Each of them has its departmental line, its protector and tormentor -- the head bookkeeping office of the ministry, the head planning and economics administration, and also the Ministry of Finance and the Gosplan. Economic work that was previously unified has ended up divided into two parts. Which is stronger. The planners obviously have the advantage: by definition they are entrusted with the preparation of decisions, that is, a central place in administration. But on the other hand, the funds, without which no decision can be implemented, are under the control of the head bookkeeper. And the system of economic accounting, which has been smoothed out over the centuries, without which one does not know what a decision is worth, is also under the head bookkeeper ...

In such situations a force known by the name of Parkinson's Law comes into effect: if an administrative task is entrusted to two parties, there will inevitably appear a third party, who will be in charge of the first two. A head economist has appeared -- the deputy director for economics. It would seem that the problem is solved, and the unity of economic work and the one-man responsibility for its quality have been restored.

Nothing of the kind, as they say. Everyone deals with economics at the enterprise: designers and technologists, mechanics and energy engineers, transportation workers and instrument makers, supply workers and salesmen, not to mention what is still the major force -- the basic production shops. And all these areas in the work have their own organizational forms, and their own positions both in the structure of the enterprise and in the ascending line of functional jurisdiction -- to the all-union production association, industrial ministries and functional state agencies. The functional specialization of administration is being joined more and more actively by numerous scientific research institutes where work is developing on a broad front for forming various departmental plans and reports. Everyone does his job actively and conscientiously. For instance, the head technical administration distributes to the enterprises plans for the introduction of powder metallurgy that are based on the task of providing a ministry indicator of the assimilation of progressive technologies, and requires the corresponding report on the attached form, and the next administration, which is also a main one, gives an increased assignment for releasing wastes to Vtorchermet. And so forth. In the Novosibirsk instrument building association an average figure was revealed for 1982: each day 4.8 orders, letters of instruction and methodological prescriptions came from the higher levels. And the calculation included only those documents whose implementation requires special plans, instructions or orders in the association. About 20 directive indicators were included in the plan, and the rest are calculated. Most of the calculated indicators are related to those in the plan through four arithmetic operations. The policy for performing the arithmetic operations is presented in the instructions, methodological guidelines and leading technical materials. There are several hundred instructions per year regarding all kinds of issues. There are more than a thousand report indicators controlled from above. The number of possible inspections, commissions and general inspections is not limited, and there can be several of them at the same time. And against this background -- the economic service of the enterprise carrying out economic maneuvers and optimizing the economic decisions in the space of possible conditions. And this space itself is squeezed into some mathematical point ...

Still the situation is not so terrible for specialists in plant economics, and they do not look with such gloom at the possibility of influencing plant business. A solution can always be found, and more than one of them.

The formal solution. If the department needs an indicator, give it one. The main thing here is a well filled-out document. In the extreme case, with a reference to a contradictory instruction from another department. There is a real chance that the commission for checking on, for example, socialist competition, having seen the ideal documentation regarding this question, will be quite satisfied and will not look at the sections or the brigades. There is no chance of a favorable outcome if there is no documentation, regardless

of how extensively the competition may be developed. If we were to introduce the position of engineer for competition (the department would support us here) and if the documentation were in order -- he would get money for this.

The essential solution. Theory asserts that economic control consists in the distribution of resources. Practice -- based on many years of universal experience -- tells us that it is impossible to operate normally without reserves. Under the conditions of an industrial enterprise a reserve is a resource which is not taken for a mandatory planned assignment. It must be one way or the other, for this is an indispensable condition for operation, a condition for the fulfillment of the plan, a condition for its being mandatory. And enterprises have reserves at all levels and in all units of production and economic work. Proof of this is the fact that most of the enterprises, shops, sections and services are operating successfully. But there are also those where the reserves are altogether exhausted or almost fully exhausted as a result of many years of the practice of planning from the level that has been "achieved." In places where the work gradually or "suddenly" falls apart, it is necessary to augment the resources not by the normal autonomous financing methods, but from other sources, from centralized funds or through redistribution at the expense of other enterprises, shops and sections.

It would be hard to find a manager who would be attracted by such a prospect. And every manager -- of an association, plant, shop or section -- tries to create, preserve and, if possible, increase his reserve resources. Either under the planned policy, deliberately, in the most expedient form, or in a covert form, separate from the plan, a form that is random as possible and accessible to the secret reserve. For example, in the norms and normatives. In the form of "under-the-counter stocks." Supplies of materials that are in short supply in excess of one's own need so that they can be exchanged for another kind and brand if the supplier does not come through. Through "precise" -- by no more than up to 101 percent -- fulfillment of the plan. Life has given birth to a number of these forms which compensate for the lack of reasonable planning possibilities.

And so there are two solutions: formal and essential. The former will cause nothing but harm, and it should be closed off and eliminated. The latter is necessary. Distorted forms of maintaining reserves lead to waste and they are not very effective; they should be replaced with planned forms, that is, scientifically substantiated, calculated forms.

A national economic assignment that is clearly given to the enterprise, the possibility of its handling the resources allotted to it independently and the elimination of nit-picking regulation which give rise to a flow of paperwork and impedes operation -- all these are fairly obvious conditions. They will make it possible to turn the economic services of the enterprises toward a creative search for more effective variants of management decisions as the main content and major direction of their work. It will be possible for them to be "navigators," as P. G. Yefremov writes (EKO, 1983, No 4). The decisions of the November (1982) Plenum of the CPSU Central Committee inspire confidence that these conditions will be provided.

What is the position of the economic services in the overall structure of administration of the production association (enterprise) and what is its own internal structure? In this issue, I. I. Usacheva and certain other participants in the discussion, in my opinion, "change the subject." In their statements and suggestions one can clearly see a desire to equate the economic service of the enterprise with the economic service of the head economist (or deputy director for economics). But these are different concepts. The unity and integrity of the economy of the enterprise as a unified economic organism and the unity in economic work of the entire totality of specialists participating in it certainly do not require that they be directly under the jurisdiction of the head economist. Moreover, such a system could cause harm. I shall try to show this.

The special-purpose structuring of administration as one of the most effective directions for improving the organizational structures of enterprises and production associations presupposes the creation of functional special-purpose blocks. Their managers are given full rights to dispose of the resources allotted for the given purpose. Of course, they are completely responsible for their utilization in comparison with the level of achievement of the goal. Thus the block of technical services serves the goal of technical development and is headed by the head engineer, the deputy director for production controls the production block, and so forth. Is it possible to place the economic goal in the same series of thus localized goals and correspondingly contain its localization within organizational frameworks? Probably not. The economic result, I repeat, is a total, common and generalized result which is achieved through the efforts of all units of the association. Every special-purpose block contributes its own bit to the formation. If there is intra-business accounting, each such contribution can be evaluated in comparable indicators (planning and report) -- an effective method of economic control of the work of the special purpose blocks.

But how will the special-purpose blocks operate if all of the economic side of their work, instead of being handled by professionally trained specialists, is removed from their jurisdiction and placed in the charge of another manager of the same rank? Any section of the work and any matter in economic organization requires an intelligent economic approach and a reliable evaluation of the results. If the work section is small, one can teach the managers to understand the economic side and the consequences of their decisions. For a large volume of work one might need a specialist as an assistant. A large block requires its own economic service.

I. I. Usacheva is distressed about the fact that the division for labor and wages at their enterprise is under the jurisdiction of the deputy director for labor and social problems. I think that such a measure should be welcomed, -- it is correct! Labor is almost the most limiting resource and high turnover is a disaster. Who is responsible (besides the top manager) for turnover at the enterprise, and has, in addition to the responsibility, the possibility of controlling this process? The deputy director for personnel? But he only documents the hiring and firing, occupational training and (if there is any) occupational orientation. But what about the other, decisive factors? Wages and the number of personnel in the various subdivisions -- another deputy director, the utilization of the worker in production -- a third , the housing

fund, medical service, kindergartens and recreation bases -- a fourth, and, finally, technical conditions for work (equipment and instruments, technology, energy availability) -- a fifth. And this is still not a complete list.

Of course one cannot entrust one deputy with both technical and organizational-economic factors. But the main organizational-economic factors can and should be concentrated in one person's hands. Then the manager of such a block will have to decide what to spend money and efforts on and in what amounts. On expansion of vocational and technical training in order to compensate for the increased departure of personnel or on improving living conditions in order to reduce turnover to a minimum.

Here is an example. A new position has appeared at several enterprises: deputy director for quality (there are departments that support this measure). Quality is important, and for certain kinds of products it is exceptionally important. But what can this official do, what resources can be placed exclusively at his disposal? Product quality is formed everywhere: in the design division and in the division of the head technologist, in the work of the repair personnel and in the production-dispatch division, which does not allow shock work. It lies in the promptness of the deliveries and the quality of materials, in the skills of the workers, and in the organization and payment for their labor. Is it the role of a permanent inspector to intervene in all these jobs? But there is an OTK for that, and it has a great deal of authority. When there is a need for it, product quality can be improved by developing and implementing a special program, which involves all subdivisions and all managers to whom it pertains. If the program is exceptionally important, its manager can be a worker who has been relieved of all other duties and raised to the rank of deputy director. It is quite reasonable to create a group for control of the program consisting of a couple of SPU specialists. But it is absurd to state that improvement of product quality requires concentration under the direct jurisdiction of the deputy for quality of all subdivisions and services which work on problems of quality.

Of course an analogy is not proof. The more so since product quality and the economics of the enterprise are concepts of different orders. But still economics is also work of a programmed nature, if only in that it pertains to all units, services and subdivisions of the enterprise and should be conducted by all of them. In this sense the head economist is like the leader of a permanent program. He has the right and responsibility for methodological support, coordination and control of the economic work in all special-purpose blocks, that is, ensuring methodological unity and coordination in time of the performance of all related economic functions. But he also has his own section of economic work: consolidated (for the enterprise) planning and consolidated accounting, the organization of autonomous financing funds for control and system evaluation of the roles of individual blocks, that is, the preparation of proposals concerning the distribution of resources among goals and functional-goal blocks. This section of the economic work is supported by the organization of the corresponding subdivisions (divisions, bureaus, laboratories) which also form the service of the head economist and are directly under his jurisdiction. And the part of the financial division which maintains relations with the Gosbank regarding short-term credit and puts money in accounts could well be transferred to the deputy for commercial work.

One more remark. The anguish about the standard structure for economic services regulated from above for tens of thousands of the most varied kinds of enterprises -- where does this come from? And why does it exist? Does the level of economic independence and responsibility of enterprises which we need today not presuppose that the internal structure of administration, the composition, the jurisdiction and the cojurisdiction of various services of the enterprise should be the prerogative of the top manager, and the tasks of his main assistant in questions of administration -- that of his deputy for economic work?!

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## EXPANSION OF CEMA'S JOINT TECHNOLOGY BANK ANTICIPATED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 198-204

[Article by S. I. Simanovskiy, candidate of economic sciences, Institute of Economics of the World Socialist System of the USSR Academy of Sciences (Moscow): "A Joint Bank for Technology of CEMA Countries"]

[Text] During the 1970's the combined scientific and technical potential of the CEMA countries increased significantly, both in quantity and in quality. An important constituent part of it is the combined fund of inventions. While in 1971 it included 46,000 technical innovations, in 1980 there were already 113,000. During this period the number of applications to register inventions increased from 149,000 to 193,000. In the USSR alone more than 33,000 inventions were registered in 1971 and 93,000 in 1980. Now the Soviet Union holds first place in the world in terms of the number of applications to register inventions and newly registered national inventions, outstripping the United States almost 2.5-fold. The proportion of the CEMA countries in the annual "portfolio" of all inventions increased from 27.6 percent to 48.4 percent. In other words, practically every second invention is created in the CEMA countries.

With such a colossal scientific and technical stockpile, it is not always justified for the CEMA countries to turn to the West for new technical equipment and technology. It would be expedient to conduct a careful inventory of the stockpile, to evaluate it and to select all technically and commercially effective developments for introduction into production. This will make it possible to refine and improve the system of international specialization and cooperation among the CEMA countries in science, technology and production.

There is an analog for such an inventory. It is the evaluation of the raw material, fuel and energy, material and financial resources when determining the scale, structure and forms of economic cooperation of the CEMA countries. Priority is given to inventions in the branches that are involved in the implementation of long-term special-purpose programs for cooperation and specific general agreements and contracts, including those adopted by the 36th CEMA Session concerning cooperation in the production of microprocessing

equipment, robot construction and atomic energy. Progressive technical decisions are also playing a larger role in implementing the food programs in the USSR and the other CEMA countries.

The next stage is the formation of banks of technical decisions concerning the most important areas of the development of the national economies of these countries. With the help of international information systems that exist within the framework of the CEMA, it is possible to select and group inventions and other advanced technical decisions in these banks. Information about technical developments regarding concrete production problems could perhaps be published in special information publications like the widely known bulletin "Product Licensing Index."

Subsequently, the sphere of activity of the bank of technical decisions could obviously be extended from the priority directions to other areas of scientific and technical development, having created as a result a unified bank of technology of the CEMA countries. It will have to be ranked in terms of three time standards (current, medium-term and long-range planning) for prompt preparation of production for introduction and clear determination of the stages in the cycle science-technology-production.

The common scientific and technical stockpile is distributed among the CEMA countries according to the needs of their national economies and the improvement of the system of international specialization and cooperation of production. Various forms of this redistribution are possible: one-time transactions, licensing agreements, contract-orders and cooperative ties, which apply both to the creation and to the introduction of new technical equipment and technology.

Another important component of the joint technology bank is the personnel potential of the countries in the community, whose scope and skill level make it possible to solve the most complicated scientific and technical problems. With deepening specialization and cooperation among these countries in scientific research and developments its effectiveness can increase, particularly through the creation of international personnel subdivisions for solving concrete scientific-technical and production problems. Moreover it would be expedient to standardize the national systems for training scientific workers and to create conditions for free migration of scientists and specialists within the framework of the CEMA. One could also include here international competitions for filling vacant positions of professors, teachers, associates of scientific research institutes and so forth.

With the current level of development of information systems, the identification of a concrete scientific and technical problem makes it possible to find almost all the scientists and specialists who are dealing with it in individual countries and the community as a whole. This makes it possible to select the developers efficiently and effectively, to determine the most appropriate organizational form for their activity, and to find an optimal combination of scientific research, planning-design and experimental-introductory aspects within the framework of international scientific production associations.

Another important merit of the common bank of technology of the CEMA countries is the combination of national stocks of scientific research equipment into a unified fund and its optimal utilization on the basis of specialization and cooperation of NIOKR. It could be used in the form of leasing (hire, rent). It would also be appropriate to have international wholesale trade fairs and auctions of equipment that is not being used and is subject to replacement. Such forms in combination with the training of the technical and engineering personnel of the countries interested in using this equipment would appreciably increase the effectiveness of NIOKR and would reduce the time periods for research and experimental work. Moreover, there would be a considerable reduction, on the one hand, of the shortage of technical means for scientific research, and on the other, the unjustified accumulation of unused equipment.

The overall stockpile of scientific research equipment should be formed on the basis of an inventory of the national stocks and the publication (with a coordinated classification) of bulletins which give information about these stocks and about the needs of the countries for one kind of equipment or another.

Since one of the main tasks of scientific and technical cooperation of the fraternal countries is efficient introduction of the latest achievements into production, it is important to create and develop a joint introduction base, especially for technical decisions that provide for the implementation of large integration measures. Here it is equally necessary to inventory the experimental and introduction subdivisions in the CEMA countries and to analyze their organizational forms, branch structure and financing mechanism. It will be necessary to study the possibilities of creating international branch and interbranch scientific production associations. In them we could concentrate the material and technical base and also specialists in the introduction of new technical equipment and technology, and in certain cases -- also the innovation fund for joint financing of this introduction.

Autonomously financed organizations for introduction are already functioning successfully in individual communities, for instance, the Pannoniya Tvorcheskaya molodezh' associations in Hungary and Progress in Bulgaria. The Hungarian experience in granting credit for the introduction of new technology through the Central Exchange-Credit Bank is interesting. This bank operates as a joint stock company (created with money from the Hungarian State Committee for Technical Development and the Ministry of Industry) through the innovation fund. There are also other effective forms which are worthy of study and dissemination.

A great effect could be produced if interested countries were to use underloaded production capacities in Poland, which has already repeatedly offered to allow other countries of the community to use unutilized highly productive imported technical equipment on a mutually advantageous basis.

These measures would make it possible to create within the framework of the CEMA a kind of international branch that specializes in the introduction of new technical equipment and technology.

The existing economic mechanism for cooperation could be improved in order to increase the efficiency of the introduction of scientific and technical achievements. The scientific and technical stockpile that has been accumulated by the CEMA countries could be shared more successfully on the basis of principles of international autonomous financing, that is, where the commodity and monetary instruments augment the planned system of exchange of scientific and technical achievements by stimulating the interest both of the suppliers and of the consumers of the technology. It is therefore no accident that in the past decade the scientific and technical cooperation of these countries has been developing more dynamically in the form of mutually licensed trade and NIOKR that is ordered on a contractual basis.

The so-called common market for technology of the CEMA countries would also make it possible to further develop the earmarked international autonomous financing in scientific and technical exchange. This term was first suggested by the Soviet economist A. N. Bykov.\* The common market for technology is understood as the combined supply of national scientific and technical resources of the countries of the community (international technology bank) and the mechanism for their free movement within the framework of the CEMA for the implementation of national and international planned measures for the development of science, technology and production.

The international bank of technology, as was already noted, includes national personnel and supplies of scientific research equipment, and also the scientific and technical results achieved both individually in CEMA countries and jointly.

The mechanism for the utilization or redistribution of the combined supply of scientific and technical resources, in our opinion, is a certain organizational structure which is reinforced by the necessary legal and economic instruments. If the international bank of technology has a needed technical innovation, direct ties are established between its owner and its potential consumer. And if it does not have such an innovation, the interested parties join together in order to develop an innovation or acquire a similar solution outside the socialist community.

Who could handle the selection of partner developers, skilled specialists, the necessary research equipment, experimental and testing facilities, and so forth? Obviously, a specially created intermediate organization, which relies in its activity on the national and international infrastructures of the scientific-technical and production cooperation within the framework of the CEMA. One of its functions would be to search for new organizational forms that provide for effective solutions to scientific-technical and production problems.

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Bykov, A. N., "Problems of Combining Science and Production in the CEMA Countries in the Modern Stage of the Scientific and Technical Revolution," paper delivered at the international symposium, "Theoretical and Methodological Problems of the Development of the 'Science-Production' Complex Under the Conditions of Socialist Economic Integration," Budapest, 1982.

General agreements concluded by the cooperating parties with the help of such an intermediate organization through the corresponding CEMA agencies would be reinforced on the coordinated plane of multilateral integration measures, long-term special purpose programs and other joint documents. As a result, the free selection of partners for carrying out concrete scientific-technical and production tasks would be augmented with the necessary planning mechanism, which would finally establish the overall value of the development, the sources and policy for its financing, the time periods for completing individual stages and the development as a whole, and also the performers and the policy for their interrelations.

The proposed system requires more detailed development and refinement. But this approach, in our opinion, would make it possible to essentially increase the effectiveness of the joint efforts of the CEMA countries to create and introduce new technical equipment and technology.

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## LEGAL RULING ON WAGE DISPUTE PRESENTED IN QUESTION-ANSWER EXERCISE

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 212-213, 218-219

[Article by M. L. Amigud (Donetsk): "What Did the Lawyer Say?"]

[Text] [Assignment]

The complaint of Shibayev, a senior engineer of the production-dispatch division, was brief. For the fourth time in a year he has been assigned to perform the duties of the division manager: their boss, a person in his declining years, could no longer stand the burden of dispatch worries and at times he would have to take off. And once Shibayev was sent to a plant which was a production unit in their association -- it was necessary to "stretch out" the plan for the products list. Shibayev did not object to the temporary transfer, since he understood that there was a very good reason for it -- a production necessity brought about by the temporary absence of the division chief. But in his complaint he asked that they make up the difference in salaries.

Before going to the general director, Shibayev tried to settle things "peacefully" and to solve the problem in keeping with the policy in the division of labor and wages. He also spoke with the head bookkeeper.

In the division for labor and wages he was told that the difference in the salaries could be paid only in cases where the worker who was being replaced was not a staff deputy or assistant to the absent party, and the time period was more than 12 days. Shibayev was not bothered by the first condition -- he was neither a deputy nor an assistant. The second condition was a little more of a problem since the chief was not ill for long periods of time, a maximum of 7-10 days, and only his business trips lasted for more than 2 weeks. But in the latter case the head bookkeeper announced that he could not pay the difference in the salaries since the order for replacement was not issued on time, that is, it was issued after the time of replacement had already started.

The general director, having attentively read Shibayev's complaint, called the head bookkeeper and the heads of the division for labor and wages and the legal division into his office. The manager of the division for labor and

wages showed the director a clarification of the USSR State Committee for Labor and Social Problems and the AUCCTU of 29 December 1965, "On the Policy for Paying for Temporary Replacement," which gives the conditions for paying for the difference in salaries of the replacement worker and the worker who is being replaced. According to this clarification, Shibayev's complaint was unjustified in three out of the four cases where he replaced the chief, since each time this lasted for less than 12 working days. In the opinion of the head bookkeeper, he should not have been paid in the fourth case either since the order was not issued promptly. Supporting his arguments, the head bookkeeper brought out a document from the last general inspection in which it was pointed out in black and white that cases where the differences in the salaries were paid in similar situations were regarded as gross violations.

"I would not like to repeat such mistakes," said the head bookkeeper to the general director, "and I would not advise you to do it. Inspections are no joke."

They had yet to hear the lawyer. What did he advise?

[Answer]

The chief of the legal division began by apparently confirming the opinion of the specialist in labor and wages: the clarification of the State Committee for Labor and Social Problems and the AUCCTU to which he referred had not been abolished. But since its publication this issue was reflected in the Fundamentals of Labor Legislation of the USSR and the Union Republics. Article 14 of the Fundamentals establishes that the labor of workers who are assigned to different jobs because of production necessity is paid for according to the work that is done, but no less than the average earnings, and this payment should be made beginning with the first day of the transfer. Thus the clarification of the State Committee for Labor and Social Problems and the AUCCTU contradicts the Fundamentals in this area. But on the other hand the clarification is in effect, and inspectors and other control agencies are to be guided by it without reservation

In this case, the lawyer continued, we are dealing with contradictions in the legislation itself. Unfortunately, they frequently arise when principally new normative acts are being adopted.

Most frequently, along with the adoption of a new law, changes are made in the legislation that was previously in effect: certain acts which completely contradict the new law are abolished. But sometimes, because of the labor-intensiveness and the large scale of legal drafting work, this is not done.

In the theory of the law, a way is also indicated to overcome such contradictions. It is formulated as a general rule: in the event of a collision (contradiction) in the norms of the law, the norms of the higher level are applied, that is, those adopted by the higher agencies of state power and administration. When there is a collision of norms that come from the same agency, the document that went into effect last is the one that should be applied.

Based on this, the ukase concerning the policy for introducing the Fundamentals of Labor Legislation of the USSR and the Union Republics, determines that until the legislation is brought into line with the Fundamentals, the existing acts are applied only when they do not contradict the Fundamentals.

Taking into account the clear contradictions between the clarification of the State Committee for Labor and Social Problems and the AUCCTU of 29 December 1965 and Article 14 of the labor legislation, when deciding on Shibayev's complaint one should be guided by the norms of the Fundamentals, which make it necessary to pay the difference in salaries when people are temporarily transferred, regardless of the amount of time during which the duties of the absent person are performed.

Moreover, one cannot refuse to reimburse a worker for the difference in salaries because the order was not submitted on time. For prompt issuance of orders is not the concern of the worker, but of the administration, and if the latter has been late in issuing the order, this circumstance cannot deprive the worker of the right to receive the difference between the salaries.

After such a convincing presentation by the chief of the legal division of the provisions of legislation, the general director, without any doubts, made a decision to satisfy Shibayev's request.

When considering the situation that has been described from both positions, one cannot but note that prolonged delay in eliminating the contradictions in existing legislation disorients practice and does not contribute to correct and error-free application of the law.

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## READERS COMMENT ON EKO'S PUBLICATIONS CONFERENCE IN BELORUSSIA, FAR EAST

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 83 pp 214-217

[Article compiled from materials submitted by L. P. Barabanova (Minsk), Ye. P. Tsybina (Gomel), and L. I. Votintseva and N. I. Savin (Vladivostok): "Meetings in Belorussia and the Far East"]

[Text] In the first half of 1983 conferences of EKO readers were held in Minsk, Gomel and Vladivostok. The deputy editor-in-chief, Doctor of Economic Sciences B. P. Orlov gave information about the editorial plans.

Critical remarks of the readers and suggestions for improving the quality of the publications and expanding the subject matter are of great interest to the editorial staff. We offer some of these for your attention.

Minsk

The chief of the division for the introduction of new methods of planning and economic stimulation under the BSSR Gosplan, N. G. Barabanov, announced that 15 ministries and departments of the republic are already operating with autonomous financing. In his opinion, the main principles of autonomous financing should be the same at all levels of administration. The changeover of the ministries to autonomous financing, however, has not increased their economic responsibility to enterprises under their jurisdiction. Everything has been reduced to the formation of a bonus fund for workers of the ministries and there has been no significant improvement of their legal situation in matters of economic activity. "Practical workers would be grateful if EKO were to participate in solving this problem," noted N. G. Barabanov.

A division head of the Scientific Research Institute of Scientific and Technical Information, L. M. Krugov, compared modern and outdated method of economic thinking and actions. He called for the creation of a theory of introduction of innovations and suggested introducing in the magazine a permanent column entitled "Introduction of Scientific and Technical

Achievements." A division head of this same institute, Candidate of Technical Sciences O. I. Prikhodchenko thinks that the magazine could provide more regular materials on the course of the implementation of government decrees concerning economic issues, and also elucidate foreign practice more thoroughly. The director of the institute, Doctor of Economic Sciences V. F. Medvedev noted that EKO should not try to include too large a group of problems and that it is necessary to have more profound articles on the fundamental aspects of the country's economic and social development.

The chief of the laboratory for scientific organization of labor and control of production of the Minsk worsted combine, N. V. Noskova, emphasized that one of the central problems for the enterprise and, consequently, for the magazine is still the economic independence of the enterprise. In particular, it has extremely limited rights to conclude agreements with scientific research institutions. "The director is bound by his hands and legs and is kept in diapers," said the deputy general director of the Minsk association of the meat industry, Candidate of Economic Sciences T. B. Broyda. He thinks that EKO should contribute more resolutely to posing and solving these problems. Managers of enterprises are "enslaved" by a multitude of indicators, and each year 3-4 more indicators are introduced. In his opinion, it is necessary to fight for a minimum of planning indicators and for the abolition of limits on numbers of workers and assignments for reducing administrative and management expenditures, as well as for real autonomous financing on the basis of a radical improvement in price setting.

"In the magazine it is better to present the plant level of administration than the branch or national economic level," said a docent of the Institute of the National Economy imeni V. V. Kuybyshev, Candidate of Economic Sciences M. N. Shatikhina. "There is also a bad side to the magazine's great popularity: the declining interest in it on the part of investigators of problems of economics, the more so since we publish more articles on administration and organization of production than on actual economic subjects. The critical material sometimes does not contain constructive suggestions. I should like for the editorial staff to maintain a balance in these questions."

The sector chief of the institute of problems of administration of the national economy of the BSSR Gosplan, O. Yu. Novozhilov, suggested conducting an "inventory" of ideas expressed on the pages of the magazine and trying to name the organizations that have to do with their slow implementation.

Gomel

A university docent, G. A. Naryshev, noted that EKO is not included in the list of magazines that are recommended to students, and that it should be oriented toward a larger reader audience -- future production managers. The head of the university's department of political economics, V. F. Bondarev, suggested publishing more articles about improving the economic mechanism and the structure of administration of the national economy and about systems for improving product quality. Docent G. K. Kotov discussed in particular the fact that the magazine needs to show problems of territorial administration more extensively. Thus the Ukrainian and Belorussian forested areas are

solving the same problems, but there is no contact between their administrative agencies.

The chief of the planning division of the repair and housing construction administration, M. A. Lysyy, discussed the neglect of their branch and the indifference of science to this type of enterprise. In his opinion, the magazine has the opportunity from time to time to provide articles about repair and construction subdivisions, on which the work of other enterprises depends to a great extent. A docent of the cooperative institute, A. A. Igolkin, suggested expanding the magazine's subject matter through such a sphere of economics as cooperation.

#### Vladivostok

A sector chief of the institute of economic research, Doctor of Economic Sciences N. I. Savin requested that the magazine organize a competition of essays on directors of enterprises and focus on the sea with columns such as "Man and the Ocean" or "Economics of the Ocean." We should also provide room for long articles and introduce a section entitled "Economists Joke."

A docent of the institute for increasing the qualifications of management personnel in the fish industry, Candidate of Technical Sciences Yu. T. Shmelev, discussed the fact that it is necessary to do a more serious analysis in the press of the work of the ministry staff. Another problem for EKO, which was suggested by Yu. T. Shmelev, is an analysis of the activity of the branch scientific research institutes which sometimes suffer from inactivity because of the lack of strategy for scientific research.

The administrator of the TYuZ, G. D. Gavrichenko, would like to see in the magazine articles about the economics of culture. A worker of Dal'zavod, V. S. Koleda, asked the editorial staff to give more information on two problems: family education of active members of the society and the utilization of engineering and technical personnel in jobs other than those for which they are intended. A worker of the USSR Ministry of Internal Affairs agencies, A. A. Nagornyy thinks that it would be appropriate to publish in EKO information on problems of criminal liability in economics and also in industrial losses which reach very large amounts in Maritime Kray, for example.

As we see, the range of problems raised by our readers is extremely wide. The editorial staff promises to think quite seriously about all these suggestions.

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## MULTIPLICATION PROBLEM -- SATIRE ON BUREAUCRACY

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian  
No 11, Nov 83 pp 220-222

[Article by V. G. Ramm (Leningrad): "16 X 9"]

[Text] My immediate supervisor and I were called in to see the boss.

"We want to try once again, Vladimir Grigor'yevich, to give you a responsible assignment," said the division chief.

"It is necessary to develop a method of multiplying 16 by 9. But remember that this job is being done on instructions from the ministry and will be introduced at all of our enterprises. It must be done extremely conscientiously and the specific features of the branch absolutely must be taken into account. Visit the plants and become familiar with the literature ... How much time will you need?"

"No time at all," I answer. "16 times 9 is 144."

"Do not be in a hurry, Vladimir Grigor'yevich," the deputy division chief gravely interrupted me, "or you will mess up again as you did last time. It must be made clear that the work was done by a candidate of sciences! The methodology should be, on the one hand, highly scientific, and on the other -- simple and comprehensible enough. Two weeks, I think, is enough for the first variant. It should not be pushed further -- or we will be left without a bonus. Consider that."

After 2 weeks I went before the managers with my necessarily short answer: "16 X 9 = 144. In order to obtain this result, 9 can be imagined as 10 - 1; therefore we add a 0 to 16 and receive 160, and then we subtract 16, that is, 160 - 16 = 144. That's it."

They were silent.

"I am bothered by the fact that you suggest a three-stage path," the division chief began softly (a man of sparkling erudition and great tact). Is this really necessary? Up to this point we have gotten by with a two-stage path,

although we have had to deal with a few more numbers! Remember when last year we multiplied 24 times 4, and it was all right -- we managed with two figures. You must keep in mind that at plants of the branch specialists will have to spend 50 percent more working time if they use our methodology. And this at a time when the entire country is striving to increase productivity!.."

"But this is not the main thing," interjected the person responsible for introduction (a go-getter who was also in with the highest circles), "the higher-ups will simply not approve a product that contains identical figures. They consider this to be hack work. Tamara Konstantinova told me directly: 'They are too lazy to count, and so they write the same number twice!' No, boys, we must strictly adhere to the standard -- the multiplication table. And there," he concluded sarcastically, "I do not recall any products that include identical numbers... "

The deputy division chief entered the discussion (a person with modest experience in life and production):

"This might not be important, but in the local areas will they understand the methodology proposed by Vladimir Grigor'yevich, or will they be able to deal with it? Not all of them have even a higher education, not to mention scholarly degrees. Something has to be 'represented' and something subtracted ... Why intellectualize in this way? And the main thing is that a zero has to be added to 16. This is always the case, you know! .. Incidentally, the bookkeeper at our plant in Zelenoborsk had his hand slapped precisely for adding zero. I don't know, I don't know... Maybe I am already old and am not familiar with new trends. But I have a grandson; true, he is not a candidate of sciences," he looked at me significantly, "but only in the second class, but he knows the multiplication tables by heart. I have never heard anything from him about adding zeroes. In my opinion, this scientific verbiage cannot be sent to the enterprises -- we must protect ourselves. But I do not insist; let us decide together; that is why we gathered here."

My immediate superior stood up (a man of duty and high moral responsibility). He was a little pale:

"Comrades, this is all my fault. I entrusted this work to Vladimir Grigor'yevich and did not maintain strict supervision of his work, assuming that he is an adult, intelligent and sufficiently conscientious person. I was mistaken and am prepared to take responsibility. I ask the management not to punish Vladimir Grigor'yevich. Maybe today's discussion will serve as a lesson to him, and I will commit myself to developing within 10 days a generally acceptable method of multiplying 16 times 9, one which we will not have to be embarrassed about later. True, I will have to work on my days off, but I myself am to blame: one must trust, but one must also check."

He smiled bitterly and sat down without looking in my direction.

They all departed silently; everyone was embarrassed for me.

Including myself.

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